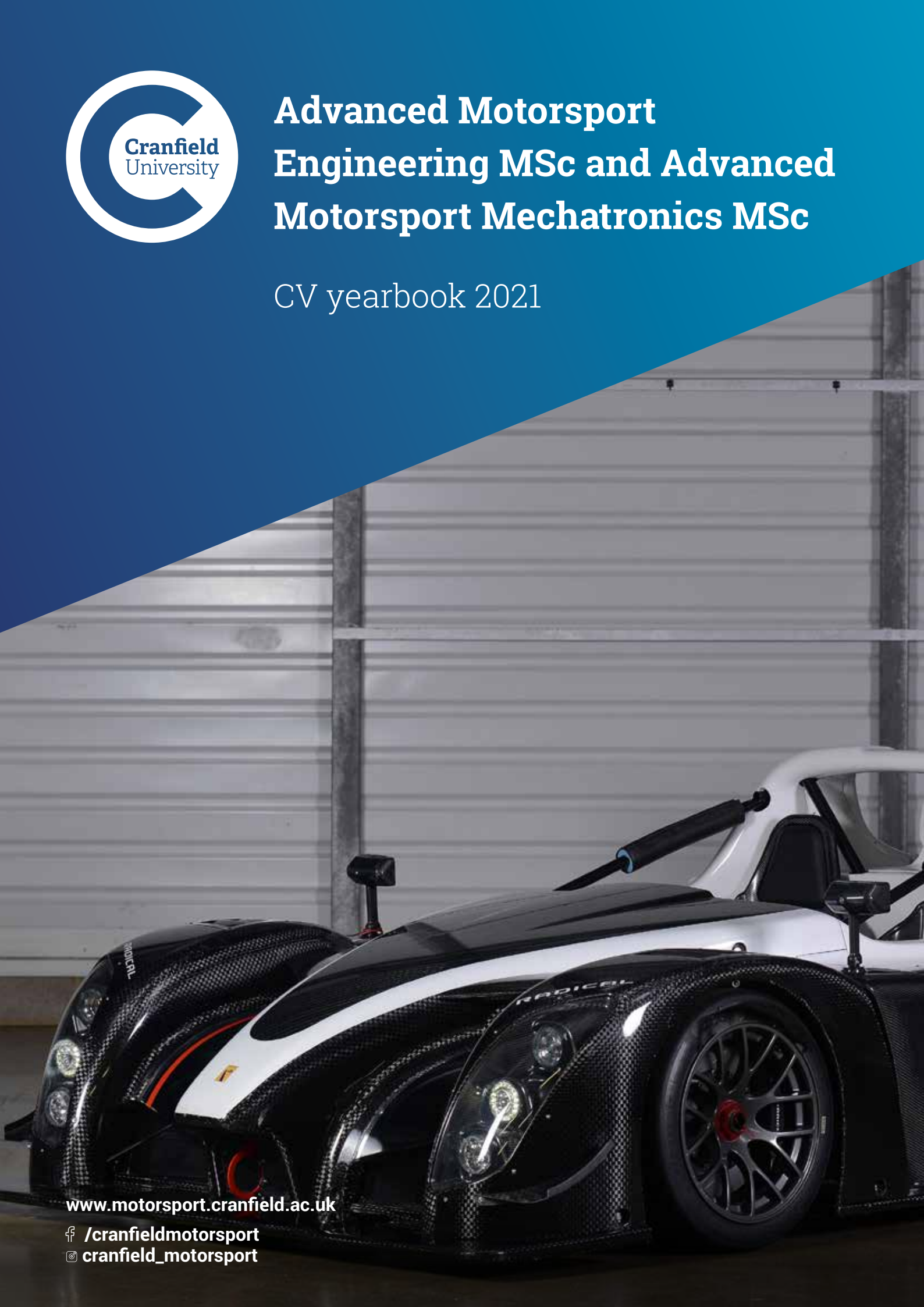
Advanced Motorsport Engineering MSc and Advanced Motorsport Mechatronics MSc

CV yearbook 2021



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Ways of working with us

Businesses looking for innovative, cost-effective solutions to their organisational needs can benefit from working with Cranfield University. We are passionate about ensuring our research is of relevance to the real world and actively seek to develop long lasting relationships with commercial organisations.

There are a number of ways in which your business can benefit from exploiting Cranfield's unique knowledge and expertise, and our flexible consultative approach. We work with organisations of all sizes across the private, public and charitable sectors.

Collaborative research and development
Cranfield has vast amounts of experience of developing collaborative projects and partnerships with businesses. External sources of funding are often available to help maximise the value of the research.

Consultancy
Our knowledge and skills cover a multitude of sectors. Projects can range from use of laboratory facilities to long-term change projects.

Sponsoring student projects
Sponsored student research allows businesses to tailor research projects to their needs, benefitting from expert technical input from Cranfield academics and the 'extended' interview period this method offers.

Strategic partnerships
A number of options exist for organisations to develop strategic partnerships with Cranfield - for licensing and joint IP development, for specific technology development, to exploit and transfer knowledge or for specific research.

Collaborative funding schemes
Part-funded schemes are available for organisations looking to engage in research.

Projects	Duration
MSc group project	2-4 months
MSc thesis project	4-5 months
MSc by Research project	1 year
PhD project	3 years
EngD project	4 years

Find out more at
E: business@cranfield.ac.uk
T: +44 (0)1234 754042
www.cranfield.ac.uk

Cranfield University

Creating leaders in technology and management. We unlock the potential of people and organisations by partnering with business and governments to deliver transformational research, postgraduate education and professional development.

We are a specialist postgraduate university. Our close collaboration with industry means we offer relevant, practical teaching that is firmly based on our transformational research.

Winner of six prestigious Queen's Anniversary Prizes for Higher and Further Education

The Queen's Anniversary Prizes
For Higher and Further Education
2017 & 2019

A professional network of 67,000+ alumni

57% in the UK
Over half (57%) of all aerospace engineering master's students in the UK study at Cranfield each year.
HESA 2018/19

UK Top 5
For Mechanical, Aeronautical and Manufacturing Engineering,
World QS Rankings by subject, 2020

We work with 1500+ businesses and governments around the world

81% of our research is world-leading or internationally excellent
REF2014 Research Excellence Framework

5,000+ learners

Over half:

- Come from outside the UK representing 110 + countries
- Study part-time while in employment
- 30+ Are over 30 years of age

UK Top 10
For commercial research, consultancy and professional development
HESA 2018/19

Advanced Motorsport Engineering MSc Advanced Motorsport Mechatronics MSc

Cranfield University's Motorsport MSc courses develop students' skills and expertise in relation to the motorsport and high performance engineering sectors, through a rigorous combination of teaching and motorsport-related project work; both group and individual.

Cranfield University has an international reputation for its expertise in:

- aerodynamics,
- computational fluid dynamics (CFD),
- motorsport vehicle structural integrity,
- powertrain development,
- vehicle electrification and battery development,
- hydrogen and novel synthetic fuels,
- brakes and braking systems,
- vehicle dynamics,
- vehicle lightweighting,
- simulation and simulators,
- data acquisition and data management,
- Artificial Intelligence (AI) and Machine Learning (ML),
- electronics,
- tyre characterisation and modelling,
- materials technology relating to metallic and composite structures,
- structural integrity and safety systems,
- manufacturing and design,
- motorsport mechatronics including control systems.

Cranfield University is a member of the Motorsport Industry Association (MIA) and is supported by Motorsport UK, the governing body here in the United Kingdom. Its Motorsport MSc students assist the British Racing Drivers' Club (BRDC) at the British F1 Grand Prix at Silverstone. The Motorsport MSc courses are part of AVL's University Partnership scheme. Former students have gone onto careers with motorsport and high performance engineering companies around the world.

We work with partners such as:

The Advanced Motorsport Engineering MSc and Advanced Motorsport Mechatronics MSc courses comprise nine taught modules related to key areas of motorsport, a group design project (GDP) and an individual research project.

The GDPs encourage team working and management development in relation to providing technical solutions to real motorsport issues. Producing innovative design concepts are a key outcome with the student teams working to a brief. By the end of the GDP the teams will have produced detailed technical reports, posters summarising their work and delivered technical presentations. Previous GDPs have included:

- Green Gulf.
- Hybrid F2 Sidecar.
- Electric Dakar.
- Hybrid hill climb prototype car - the down-hill, up-hill racer.
- Land Speed Record (LSR) motorcycles.
- Cranfield Formula Electric Series (CFES).
- Active aerodynamics for the Reynard Inverter race car.

At the conclusion of the GDP each student is required to produce an individual reflective report. They assess their skills at the beginning of the project. At the half-way stage, following peer assessment, they meet with academic staff to discuss these assessments. They then select two areas to focus on and detail how they will improve their performance with support from their team members.

Our students are given the opportunity to access Cranfield's extensive facilities and use equipment relevant to motorsport. These include a suite of state-of-the-art race simulators, software packages and high performance computing, composites manufacturing laboratories, 3-D printing, dynameters, wind tunnels, off-road vehicle dynamics facilities, structural integrity rigs, vehicle test road, battery and mechatronics laboratories.

Motorsport steering committee

Cranfield University's Motorsport MSc courses are supported by a dedicated industrial advisory Steering Committee, comprising experienced motorsport professionals:

Professor Adrian Reynard, Director – ARC, Cranfield University Honorary Doctorate and Motorsport Visiting Professor to Cranfield University (Chair of the Committee)

Dr Paul Crofts, Chief Technologist Process and Vertical Integration – Integral Powertrain Ltd (Deputy Chair of the Committee)

Chris Aylett, Chief Executive – The Motorsport Industry Association (MIA)

Rodi Basso, Co-founder and CEO - E1 Series

Owen Carless, Head of Stress, Front of Car – Red Bull Technology

Jane Gilham, Head of Human Resources – Xtrac Limited

Ian Goddard, Head of Technical Partnerships – Alpine F1 Team

John Grant, Chairman – British Racing Drivers' Club (BRDC)

Sylvain Filippi, Managing Director and CTO – Envision Virgin Racing

Ron Harvelt, Managing Director – One Group Engineering Ltd

Gerry Hughes, Commercial Director – Swindon Powertrain Principal - Gx2 Consulting Ltd

Dr Pete James, CEO – Lyra Electronics

Rob Kirk, Head of Motorsport Electronics – Cosworth

David Lapworth, Technical Director – Prodrive

Dr Cristiana Pace, Motorsport Consultant – Enovation Consulting Ltd

Mike Pilbeam, Director – Pilbeam Racing Designs

Stuart Robertson, Head of Circuit and Rally Safety – FIA

John Ryan, Sport, Safety & Technical Director - Motorsport UK

Isaac Sanchez, F1 Innovation & Special Projects Manager – Ferrari Spa

Neil Spalding, Director – Sigma Performance and Technical Consultant Moto GP

Stefan Strahnz, Project Pioneer Programme Manager - Mercedes AMG PETRONAS F1

Professor Pat Symonds, Chief Technical Officer – Formula 1 Ltd and Visiting Professor to Cranfield University

Christopher Tate, Motorsport Consultant

Iain Wight, Business Development Director – Williams Advanced Engineering


RADICAL

Welcome to the 2020-21 Yearbook for the Advanced Motorsport Engineering MSc and Advanced Motorsport Mechatronics MSc courses

Please find the CVs for students who studied motorsport engineering and motorsport mechatronics at Cranfield University.

A key element within their study programmes is the Group Design Project (GDP). The students' CVs are arranged in relation to their teams for the GDP phase. In addition to their CVs, we have provided their GDP posters, team press releases and some images. In addition to these outputs, the four student teams delivered presentations and submitted detailed technical reports for the GDP assessment.

Throughout the GDP period the student teams were required to provide their weekly team meeting minutes, attend progress reviews as well as considering their individual contributions and those of their fellow team members in the form of peer assessments. In this context, each student highlighted two areas for improvement as part of their personal development. The students discussed these with academic staff at the mid-point of the GDP. Then at the end of the GDP phase, they each submitted a reflective report, covering their experience of the project and how they have developed as individuals. This is a valuable learning experience, equipping the students for their future careers. The Cranfield Motorsport Steering Committee, our External Examiner and professional engineering institutions regarding accreditation, values this. Additionally, within the reflective reports the MSc students also placed the GDP in the context of ethics, sustainability and the environment. We know the motorsport and high performance engineering sector appreciates their personal development and team working experience.

Importantly, the Covid-19 disruption was minimised by the students' positive attitude and determination. They demonstrated adaptability and flexibility. Team members were dispersed, so they made effective use of MS Teams. They utilised distributed software to work on their simulations. These were posted to the Cranfield High Performance Computer (HPC). With testing facilities closed due to Covid-19, the teams validated their work against published data.

Following on from the GDP with its onus on teamwork, the Motorsport MSc students have worked on their individual research projects, which result in presentations, thesis reports and posters.

As this is the 2020-21 Yearbook, another year of Covid-19, I would like to thank all our students for their fortitude and hard work. I also acknowledge the support provided by colleagues and to our many supporters from the motorsport and high performance sectors. Here is to success for the 2020-21 cohort in their future careers.

Clive Temple MA FCIM
Motorsport and Automotive Programme Director

T: + 44 (0)1234 754056
E: c.temple@cranfield.ac.uk

@cranclive **clivetemple**

Motorsport MSc group design project 2021:

Corona Charge

The students were given a brief to develop a conceptual design of an electric sportscar, similar to the Radical RXC Spyder with an open cockpit design, for international championship events. Their focus was on a 30-minute event plus one lap as a potential support series to the Formula-E.

Guidance for the students:

- Powertrain arrangement is free (2wd, 4wd, motors, diffs etc…).
- No maximum motor speed.
- Front wheels may be used for drive and regeneration. Torque strategy is free.
- The electrical storage must be comprised of identical independently enclosed modules, each with a maximum of 10kWh of electrical storage, 200v and 50kg of cells.
- It is the intention of the organisers these modules can also be marketed for other types of motorsport.
- Electrical storage modules may be cooled by air or liquid but no interconnection of liquid circuits between modules is permitted. Phase change materials are permitted.
- You may use any market-available steel or aluminium materials.
- You may use composites from a specified list of materials.
- Provide sufficient for evaluation of your concept design by a potential investor.
- Make reference to financial considerations, aiming for the target price. However, a full costing is not expected as you won't be able to determine manufacturing costs within the constraints of the project.
- Provide robust projection of key performance and design numbers.
- Do not over-claim or under-claim.
- Don't be vague. Where you have uncertainty, make it clear with reference to its implications.
- Point out where rules may be particularly restrictive and where a "better" option may be found.
- Outline interactions, completing the 'design loop'.
- Detail novelty as opposed to being explicit regarding standard practice.
- Be innovative throughout.

Press Release
Date: 30/4/21
Embargoed: 3/5/21

NEW ALL ELECTRIC HIGH-PERFORMANCE RACE CAR LAUNCHED

Altilium Motorsport are excited to launch the AM1, our brand-new all electric high performance race car, designed for a new motor racing series arriving in 2022.

Inspired by the Radical RXC Spyder, the AM1 is designed to demonstrate the performance achievable in the electrification of motorsport vehicles. The AM1 is powered by two 220kW (295bhp) Equipmake APM 200 motors that power all four wheels with torque vectoring capabilities using the latest electronic Xtrac gearboxes. The AM1 weighs just over 1200kg, has 900Nm of torque available to accelerate the car to 200 kph in 10.8 secs and a top speed of 244 kph.

Featuring an innovative and unique hybrid energy storage system, contained within a bespoke tunnel design, the development and integration of supercapacitor technology with 35kWh worth of Lithium-Ion cells enables both high power and high energy density characteristics. The novel energy storage system is interchangeable and uses cutting edge energy storage technologies, track-specific power split algorithms and direct dielectric thermal management to maximise performance, increase regenerated energy storage capabilities and prolong battery life.

Altilium Motorsport co-founder Kassandra Farzavandi commented "Covid-19 has highlighted the disruption mother nature can bring, and climate change is a far greater challenge. I believe electric racing will be brought further into the limelight and I am pleased to be part of this important change in effort at such a critical moment in time. I am standing here at the launch of our first project, which I hope will become the benchmark for all future sports cars".

The monocoque chassis of the AM1 ensures the highest levels of safety whilst the aerodynamic package delivers significant downforce and efficiency. At Altilium Motorsport we not only wanted to develop the most powerful and reliable racing car but also the most environmentally friendly car too. Therefore, in collaboration with BComp, we have developed a bodywork using 300 gsm natural fibre panels that are as stiff as 700gsm carbon fibre but with a 12% weight reduction and 88% CO_2 reduction.

The AM1 will compete in the new electric race series which is anticipated to be endorsed by the FIA very soon with the championship starting in 2022. The new race series is expected to last 30 minutes plus one lap and will be part of the Formula E weekend. It will only add to the excitement and entertainment that already exists.

The launch of the AM1 comes just six months after the UK Government's announcement to bring forward the ban on the sale of new petrol and diesel cars and vans from 2040 to 2030. Altilium Motorsport's mission is to provide exciting wheel to wheel racing while promoting sustainability, equality, and accelerate the transition for motorsports to green energies.

--ENDS--

For more information and press interview, please contact Kassandra Farzavandi on +44 (0) 7123 456789 or:

Co-Founder & Editor: Sergio Cáceres – sergio.caceres-cavero@cranfield.ac.uk
Co-Founder & Editor: Craig Evans – c.d.evans@cranfield.ac.uk
Co-Founder & Editor: Kassandra Farzavandi - k.farzavandi@cranfield.ac.uk
Co-Founder & Editor: Dominic Howe- Dominic.Howe@cranfield.ac.uk
Co-Founder & Editor: Théo Mandé – t.mande@cranfield.ac.uk
Co-Founder & Editor: Ovidiu Mihailescu - O.Mihailescu@cranfield.ac.uk
Co-Founder & Editor: John Moffat - JohnMoffat@cranfield.ac.uk
Co-Founder & Editor: Steven Rijns - Steven.Rijns@cranfield.ac.uk
Co-Founder & Editor: Bryant Tey - z.y.tey@cranfield.ac.uk
Co-Founder & Editor: Javier Vargas – j.vargas-quintana@cranfield.ac.uk
Co-Founder & Editor: Laura Villadelprat – M.villadelprat-fontana@cranfield.ac.uk
Co-Founder & Editor: Jerry Xiao - Jerry-Xiao.Xiao@cranfield.ac.uk

About Altilium Motorsport

Altilium Motorsport is a company leading the drive to a sustainable and equal future. Founded in 2021 and based in Cranfield, Altilium Motorsport aims to electrify the world through racing. Our Vision is to bring about a clean and equal future.

ALTILIUM MOTORSPORT

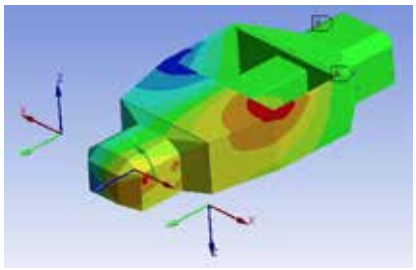
Team 1 Group Design Project 2021

Introduction

Altilium Motorsport is an electric vehicle manufacturer producing Formula-E support race cars. Charged with an innovative electric hybrid energy storage system optimised using track specific power split algorithms to power a 440kW all-wheel drive system. Proven lightweight chassis safety cell with a fully optimised kinematic design and streamlined bodywork with environmentally friendly materials whilst keeping costs under £150,000.

Chassis

Monocoque of 14 mm Aluminium Alloy 6061-T6
Sandwich panel with 1/8 Honeycomb 5052 – 0015



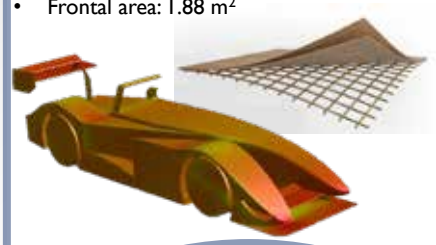
- Torsional Stiffness of 32069.22 Nm/deg
- Survives front impact at 60 km/h without exceeding 40 G's
- Survives side impact at 50 km/h lateral velocity without exceeding 300 mm of intrusion

Aerodynamics

- Lift coefficient = -1.08
- Drag coefficient = 0.48

} At 180 km/h

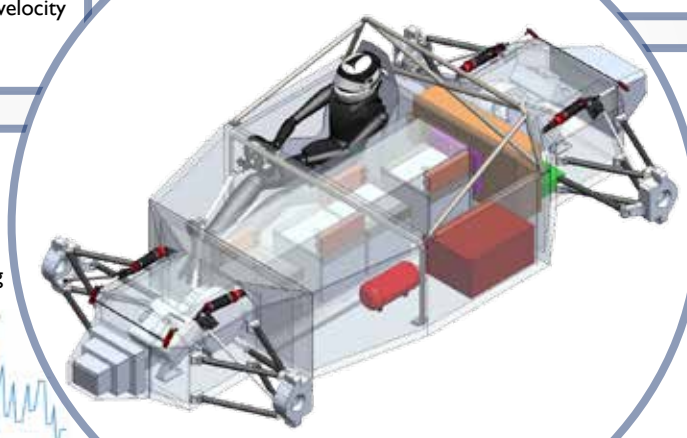
- High aerodynamic Efficiency of 2.25
- Material: Bcomp 3-layer natural fibre
- Frontal area: 1.88 m^2



Powertrain

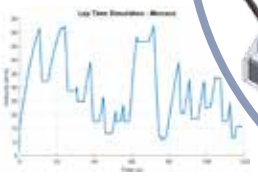
- Dual Motor AWD with Torque Vectoring
- Equipmake APM200 Motors & Inverters
- XTRAC P1227 Gearboxes, 5:1 Final Drive
- Custom compact pre-Assembled Units
- Quick installation & removal
- Push-to-Pass Function
- Power limiter for different Tracks and Push-to-Pass zones

Max. Power	440 kW
Max. Torque	900 Nm
0-100 km/h Acceleration Time	3.17 s
0-200 km/h Acceleration Time	10.76 s
Top Speed	243 km/h
Weight of Motors, Inverters, Gearboxes and Mounts	174.3 kg



Simulation

- MATLAB/Simulink 7 DOF four-wheel vehicle model with a Pacejka MF Tyre model
- Yaw correction through Torque Vectoring control
- Modelled Formula E tracks, incl: Monaco, Valencia, Santiago
- Steady-State Lap Time Simulator



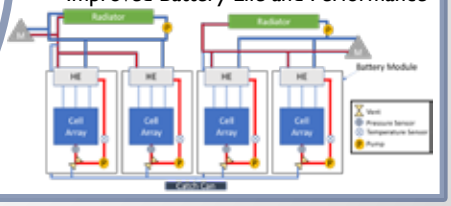
Thermal Management

Liquid Cooling for Motors

- Longer Peak Power Operation
- Improved Motor Life

Direct Liquid Cooling for Batteries

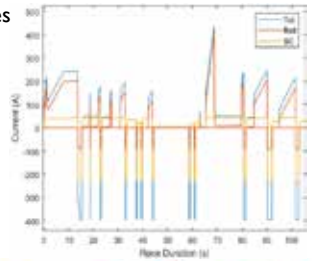
- Minimal Temperature Gradients
- Near Constant Cell temperature
- Improved Battery Life and Performance



Hybrid Energy Storage System

Supercapacitor Module 53F, 170V | 200kW DC-DC Converter

- Superior Braking Energy Storage Capabilities
- Optimisation Choices:
  - Lap times improvement: 3-6%
  - Cost (-6%) and weight (-14%) reduction

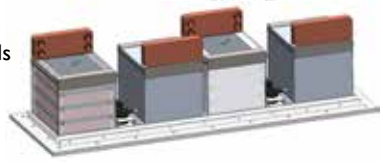


Power split

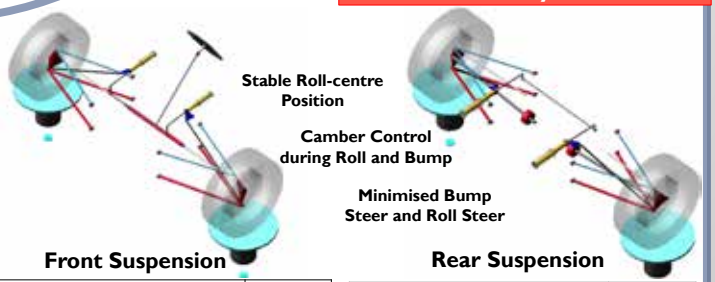
- Unique Dual Loop Algorithms
- Track Specific

Battery pack 35 kWh, 750V

- Small Size, Long Life
- Sanyo Li-Ion NCR20700A: 3120 Cells
- Capable of Immersion Cooling
- Interchangeable module



Vehicle Dynamics



Front Suspension

Performance Metric	Value
Roll Centre height [mm]	15.41
Anti-Dive [%]	20.33
Dive Braking [mm/G]	20.09
Bump Camber Change [°/mm]	0.007
Roll Camber Change [°/°]	0.12
Bump Steer [°/mm]	0.006
Roll Steer [°/°]	0.082

Rear Suspension

Performance Metric	Value
Roll Centre height [mm]	58.83
Anti-Squat [%]	21.2
Squat Acceleration [mm/G]	12.97
Bump Camber Change [°/mm]	0.0085
Roll Camber Change [°/°]	0.132
Bump Steer [°/mm]	0.001
Roll Steer [°/°]	0.04

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Sergio **Cáceres**, Craig **Evans**, Kassandra **Farzavandi**, Dominic **Howe**, Théo **Mandé**, Ovidiu **Mihailescu**, John **Moffat**, Steven **Rijns**, Bryant **Tey**, Javier **Vargas**, Laura **Villadelprat**, Jerry **Xiao**

SOLIDWORKS Composites Evolution MATLAB MSC SOFTWARE Ansys Bcomp CATIA

Altilium Motorsport

Sergio Cáceres Cavero

Craig Evans

Kassandra Farzavandi

Dominic Howe

Theo Mande

Ovidiu Mihailescu

Altilium Motorsport

John Moffat

Steven Rijns

Zhi Yong Tey

Javier Vargas Quintana

Ma Laura Villadelprat Fontana

Jerry Xiao

Sergio Cáceres Cavero

+34 648 774 954 sergio.caceres-cavero@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

A goal-oriented and innovative graduate engineer passionate about motorsport and high-performance engineering, currently studying motorsport at postgraduate level. Six months of hands-on mechanical experience followed by more than 2 years of management and engineering experience in the automotive industry. Effective communicator, fluent in Spanish and English combined with four other European languages, developed through work, volunteering opportunities and educational experience abroad. Actively enhancing technical expertise in aerodynamics and computational fluid dynamics through online certified courses. Thrives working in multi-cultural and cross-functional teams, where strengths such as resilience, analytical mind-set and solution-oriented approach are required.

KEY ACHIEVEMENTS

- Designed and assembled a test bed for characterization of engine exhaust after treatment systems at the Thermal Engines Department (CMT) for research and teaching purposes at the Polytechnic University of Valencia (UPV).
- Graduated with academic excellence (top 10%) in Mathematics (90%), Bachelor thesis (90%), Fluid Mechanics (88%) and Quality management and control (87%).
- Reinforced computer-aided design skills with further certifications in Solids, Wireframe and Surface design in CATIA V5 at the Polytechnic University of Valencia (UPV).
- Key stakeholder for market rollout of Care by Volvo in Norway, being involved in digital implementation and end-to-end flow testing in QA environment.
- Led and managed project with Mercedes-Benz Spain and generated a viable business plan for opening of a retailer in Valencia, Spain. In addition, designed and led construction of dealer show room and workshop layout, following retail standards imposed by brand. Ensured fulfilment of 100% of standard requirements to guarantee a successful opening.

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, Cranfield, UK (October 2020 – September 2021)

- **Modules:** Induction and Introduction to Motorsport, Motorsport Structural Analysis, Motorsport Electronics and Data Acquisition, Motorsport Vehicle Dynamics, Motorsport Aerodynamics, Computational Fluid Dynamics in Motorsport, The Business of Motorsport, Composite Structures for Motorsport, and Motorsport Powertrains.
- **Side project:** Current member of the F1 Design Sprint project, focusing on the optimisation of the turbocharger, intercooler, and MGU-H units.

BSc Mechanical Engineering (2:1): Polytechnic University of Valencia, Valencia, Spain (September 2012 – July 2017)

- **Modules:** Mathematics, Physics, Graphic Expression, Business, Computing, Chemistry, Mechanical and Materials Engineering I, Thermodynamics and Fluid Mechanics, Industrial Production and Project Management, Electrical, Automatic and Electronic Engineering, Mechanical and Materials Engineering II, Thermal and Fluid Engineering, Structures, Representation Systems, Thermal Technology.
- **Individual thesis:** Reactor design for characterisation of engine exhaust after treatment systems in a synthetic gas test bed.
- **Exchange program:** Universität Stuttgart (2015 – 2016).

CAREER HISTORY

ALTEN Sverige: Engineering Consultant: Gothenburg, Sweden (2019 – 2020)

ALTEN is an international Technology and IT consulting company, offering consultants to companies within Automotive, Defence & Aerospace, Energy, Industry, Life Science and Telecommunications.

Assignment: Volvo Car Corporation: Gothenburg, Sweden (March 2019 – March 2020)
A Scandinavian designed premium car brand based in Gothenburg, Sweden, but with manufacturing, research and design operations in Europe, Asia and the Americas. Care by Volvo (CbV) is a new business program within Volvo Car Group introducing a new online subscription offer in the market combining cars, financing, insurance and traditional services.

- Drove all interrelated tasks needed for a market implementation of technical systems, software, hardware and solutions needed to run Care by Volvo in Norway.
- Handled incident, problem and change management concerning Care by Volvo markets and pulled out detailed weekly and monthly reports shared with CbV board members.
- Developed a monitoring tool based on Zebra scripts and SQL programming to quickly identify website downtime and enhance car configurator availability.
- Test engineer for end to end system integration testing of multiplatform customer journey for CbV Norway, ensuring a stable environment prior to go-live stage.

Spamóvil S.L: Valencia, Spain (2016 – 2018)
BMW-MINI Service in Valencia since 2007.

After-Sales Manager (May 2017 – November 2018)

- Monitored sales objectives throughout year to ensure fulfilment of requirements to achieve 100% of monetary re-compensation.
- Planned and distributed daily tasks to technician team. Evaluated quality of reparations according to brand's expectations.
- Launched a marketing initiative with BMW-MINI marketing team leading to a 5% increase in revenues
- Increased availability of high rotational spare parts by making use of dynamic replenishment system and decreased percentage of obsolete stock by 10%.

BMW Technician (December 2016 – May 2017)

- Basic oil and fast lane maintenance along with more demanding reparations.
- Diagnostics of vehicle electronic components with precise BMW tools with posterior evaluation of failures registered and possible reparation protocols to follow.
- Replaced one MINI R56 engine together with BMW technician.
- Undertook BMW online training related to specific BMW technologies, helping understand underpinning theories and accelerating vehicle diagnostics in workshop.

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages:** Fluent Spanish and English, Upper-intermediate German and Valenciano, Basic French and Swedish.
- **IT Skills:** IT user. Experience in Microsoft package (Word, Excel, and PowerPoint). Knowledge in CATIA V5, PTC CREO, Autodesk Inventor, MATLAB, Simulink, AVL BOOST, SAP2000, ETK, Mathematica, Azure DevOps. Basic Python and C++ programming.
- **Volunteering:** El Plantio International School of Valencia - Spain (2010 – 2011)
  Assistant teacher in nursery and reception classes, organised and coordinated events in remarkable dates (Christmas, Easter, Fallas and SV), collaborated in school recycling program once per week. Visited a residential home for elderly once per month.
- **Mentored:** ERASMUS student through volunteering program “Alumno Mentor” at UPV.
- **Individual interests:** Motorsport and karting. Enjoy all kinds of physical activities and sports, specially football, American football, and functional training. Football captain during 2 seasons. Learning foreign languages, sports nutrition, cooking and travelling
- **Professional/Technical Training:** Goethe-Institut e.V. - Goethe-Zertifikat B2, Massachusetts Institute of Technology - Supply Chain Management Fundamentals course, Polytechnic University of Valencia - CATIA V5 Solids, Wireframe and Surface Design course, BMW TMSi (Talent Management System International).
- **Driving licenses:** A, A1, A2, B.

Craig Evans

07512 118885 C.D.Evans@Cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

Postgraduate student studying Advanced Motorsport Engineering (MSc) at Cranfield University with long-time plan to pursue a career in high performance motorsport engineering, fueling a fascination for solving complex mechanical problems in a fast paced and competitive industry. Aspire to be an invaluable part of an engineering team, working at the top of their industry on challenging and innovative projects.

KEY ACHIEVEMENTS

- First Class Honours Degree and Dissertation Project in undergraduate studies, 2020
- Working in pre-series audit for BMW, validated and reported faults with vehicle prototypes. Directed problem quality management processes with multiple department representatives to remove over 100 static prototype faults and 10 dynamic faults, 2019
- Operating within series vehicle validation at BMW, directed optimisation projects focusing on validation inspection timing and processes for vehicle auditing, increasing vehicle audit capacity by 30%, 2018
- Gold CREST awarded for college group project focusing on movement of nuclear waste, 2016

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, Cranfield (September 2020 - September 2021)

- **Modules:** Composite Structures for Motorsport, Computational Fluid Dynamics for Motorsport, Motorsport Aerodynamics, Motorsport Electronics and Data Acquisition, Motorsport Powertrains, Motorsport Structural Analysis, Motorsport Vehicle Dynamics, The Business of Motorsport
- **Group Project:** Four-month group project will be completed requiring resource and project management, communication and process implementation as well as specialist knowledge
- **Individual Thesis:** Thesis project will allow for individual specialist work to professional standards of research, testing and reporting

BEng Motorsport Engineering: Oxford Brookes University, Oxford (September 2016 - May 2020)

- First Class Honours achieved
- **Relevant modules:** Automotive Engines, Design of Machines, Electronic Systems, Engineering Project, Management and Ethics, Materials Engineering, Motorsport Vehicle Performance, Stress Analysis, Thermo-Fluids, Vehicle Dynamics

CAREER HISTORY

Cranfield University: Cranfield - F1 Sprint, Engine Design Project (November 2020 - December 2020)
Group design task, assisted by Cranfield staff, designing an AVL model of the 2021 regulation Formula 1 powertrain.

- Working in the turbocharger design team to optimise compressor, turbine and intercooler for accurate air flow modelling using previous model reviews received from Formula 1 teams
- Completing analysis of pressure ratios sweeps for varying compressor and turbine model variations to simulate Formula 1 powertrain data then using this to implement specific turbine swallowing curves

Oxford Brookes University: Oxford - Dissertation (September 2019 - May 2020)
ADAMs Analysis of MINI ICE F56 Suspension and Optimisation for the MINI BEV.

- Researched dissertation with support from BMW, providing a vehicle and data
- Tested MINI chassis dynamics by calibrating and running four-post-rig testing with varying input sweeps over the 3 days of vehicle access, requiring time efficient and accurate work processes
- Measured and quantified chassis dimensions into a transferable point cloud for virtual modelling
- Created MINI ICE virtual chassis suspension system using ADAMs modelling and measurements collected, optimising the model accuracy over multiple iterations
- Validated model against real-world four-post-rig test data and cornering capabilities over a 2-month period
- Created MINI BEV virtual chassis model and modelled weight variation due to electrification
- Simulated and compared MINI BEV model against real-world data and ICE model results, calculating maximum cornering ability and acceleration performance

BMW Group MINI: Oxford - Audit Quality Placement (June 2018 - July 2019)
BMW Group is one of the largest global vehicle manufacturers, producing a range of high-quality road vehicles across multiple manufacturers.

- Initially focused on managing series testing, validating and reporting of vehicle faults. Provided vehicle reports then confirmed and steered them to the correct manufacturing department. Communicating across multiple departments to analyse and align quality standards
- Raised and assisted in the steering of over 150 series product quality management reports, validating new processes that removed hundreds of possible warranty faults
- Performed process optimisation analysis of current processes and created new more efficient and transparent processes for both dynamics and static testing in pre-series and series vehicle validation
- During latter half of the year took responsibility for management of people and resources for both series and pre-series auditing. Leading teams of auditors, validation teams and Rolls Royce audit quality alignment exercises
- Developed and managed audit processes for the Mini BEV and GP3 focusing on testing, documenting and reporting faults to department managers and collaborating to find solutions. Ensured IP security and vehicle privacy during prototyping phase, liaising with assembly to monitor model transport and location
- Led a variety of teams, to complete series and pre-series quality projects efficiently, for MINI and Rolls Royce

Oxford Brookes Racing: Oxford - Formula Student (September 2016 - August 2017)
Oxford Brookes Racing formula student team is one of top FS teams in the UK.

- Collaborated in development of racing solutions within chassis and off-track groups
- Optimised Impact Attenuator to have equal energy absorption but lower mass to a previous design
- Volunteered and worked with the materials manufacturing team to prepare carbon fibre component moulds
- Joint led promotional content, creating a new partnership with TE Connectivity and OBR in off-track business development worth over £10,000

Engineering Development Trust: Liverpool - Discovery Scholarship Participant (January 2016 - March 2016)
Discovery Scholarship was a STEM based design challenge for college teams.

- Led a design project for Low-Level Nuclear Waste Transportation
- Steered group research to provide sufficient theory and validation behind design concepts and reporting
- Fabricated and optimised project model over a two-week period
- Presented final design to industry representatives at a high enough standard to earn a gold CREST award

North West Face Climbing Centre: Warrington - Climbing Instructor (May 2012 - August 2018)
Indoor rock-climbing centre providing climbing experiences for ranging levels of expertise.

- Became a senior rock-climbing instructor in 2013, having climbed since 2007
- Provided instruction at varying complexity levels ranging from groups of juniors to individual advanced instruction of technique and training for seniors
- Took sole responsibility for wellbeing, safety and instruction of customers. Managing and leading all ages with a focus on safety processes to minimise danger

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- Experimenting with software's such as ChassisSim and Ansys Fluent to advance motorsport engineering abilities
- **Interests:** Motorsports interests include main formula series and attending multiple GT and BTCC events
- Supported a Mazda race team, providing practical experience and insight into motorsport racing
- **Sports**: Main sport has been rock climbing for over 12 years. Also, a keen road cyclist for over 5 years maintaining bikes and fitness
- **Interests:** Test creative abilities through playing piano and guitar, combining these with music production in Ableton

Kassandra Farzavandi

+44 7983 939174 k.farzavandi@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

An innovative, goal-driven individual with professional experience in design, test, and development engineering, with an emphasis on project management and implementing problem-solving solutions for projects. Displays a keen passion for motorsport and automotive industry evident from related studies and work experience. Possesses strong analytical, project management and communication skills and a drive to deliver results to the highest standards. Able to be flexible and adaptable in working in a team-driven, multi-cultural and dynamic environment. Highly competent in engineering software such as AVL Boost, Solidworks and MATLAB, and hands-on mechanic experience.

KEY ACHIEVEMENTS

- Involved in Cranfield F1 Powertrain Design Sprint. Played a role in energy recovery systems modelling.
- Recognised for playing a key part in the success of major project development and was tasked to confidently lead a test and verification team for Millbrook Special Vehicles (Millbrook SV).
- Chosen by Millbrook SV's managing director to be a Woman in STEM representative for Birmingham City University's Women in Engineering and Computing Day.
- Achieved an Engineering Merit Award at Ngee Ann Polytechnic for final year project that displayed exceptional work and creativity.

EDUCATION

MSc in Advanced Motorsport Engineering, **Cranfield University, UK (October 2020 – October 2021)**

- **Relevant Modules:** Powertrain design, Motorsport Electronics and Data Acquisition, Aerodynamics, Computational Fluid Dynamics, Business of Motorsport, Structural Analysis, Composite Structures, Motorsport Vehicle Dynamics.
- **Extra-Curricular Project:** Student-led F1 Powertrain Design Sprint. *Using AVL Boost to develop an intuitive model of an F1 powertrain system. Mainly involved in the turbocharger and energy recovery systems modelling.*
- **Group Design Project (Current):** Design and development of an electric sportscar for international championship events. *Focused on the design of an electric race car powertrain system.*
- **Individual Thesis:** 2 Stroke Opposed Piston Engine for F1 Powertrain Feasibility Study. *To be confirmed.*

BEng (Hons) Motorsport Engineering, Oxford Brookes University, UK (September 2016 – May 2020)

- **Relevant Modules:** Automotive Engines, Management, Ethics & Sustainability, Motorsport Vehicle Performance, Automotive Electronics, Thermodynamics, Advanced Materials & Composites, Stress & Dynamics, Mathematics & Modelling.
- **Group Design Project:** Suspension design project in converting a BMW 1 series front suspension system suitable for World Rally Cross Championship. *Conducted a design process of upright and chassis by producing CAD modelling, technical drawings, manufacturing simulation & tool creation and theoretical load calculations.*
- **Final Year Dissertation:** ADAMs Suspension Optimisation Simulation in collaboration with Millbrook Special Vehicles. *Developed a suspension simulation model that mimics experimental testing with the ability to input vehicle data and output transient vehicle dynamic behaviour. Subject to Non-Disclosure Agreement (NDA), reflecting the competitive and confidential nature of the automotive industry.*

Diploma in Mechanical Engineering, Ngee Ann Polytechnic, Singapore (September 2013 – May 2016)

- **Relevant Modules:** Fluid Mechanics, Automotive Technology & Motorsports, Instrumentation & Control Systems, Mechanics of Machines & Materials, Thermodynamics, Computer Programming, Applied Mechanics.
- **Final Year Group Project:** SENTINEL vehicle powertrain conversion project. *Involved in the development and implementation of converting a manual drive vehicle to an electrically driven, unmanned ground vehicle). Majorly involved in the powertrain system development. Performed calculations, designed assembly layout, and specified components for the installation of a brushless DC motor to the existing transmission and batteries.*

CAREER HISTORY

Formula Fast Indoor Karting Ltd: Milton Keynes, UK – Track Marshal (September 2020 – Current)
A multi award-winning indoor kart track that is one of the biggest indoor circuits in the UK.

- Maintain karts, pit lane and track areas ensuring they are clean, functional, and safe.
- Review with customers track regulations and safety before assisting them into karts.
- Actively manage and monitor races with race director and fellow marshals.
- Provide cadet training for kids on driving karts and racing line techniques.
- Communicate effectively and assist with garage mechanics on engine and chassis maintenance.

Millbrook Special Vehicles Ltd: Bedford, UK – Design and Test Engineer (July 2018 – July 2019)
A leading expert company specialising in vehicle conversions that utilises automotive engineering knowledge and extensive test facilities to produce vehicles with enhanced capabilities.

- Design engineer that played a key role in an innovative powertrain conversion project that repowered old, non-functioning buses with a new powertrain system adhering to Euro VI emissions regulations.
- Proactive in identifying issues and designed problem-solving solutions utilising Solidworks CAD, taking it from unique concept design and CAD drawings to fabrication and test.
- Created jigs and components for rapid prototyping and retrofitment involving 3D Printers.
- Worked with a 3D scanner of a vehicle chassis on VX Elements software to implement component designs.
- Led a vehicle test and verification team of six people. Arranged and conducted test instrumentation, procedures, and data analysis. Tackled unforeseen issues and test failures through teamwork and troubleshooting.
- Directed the installation quality audit for the project and ensured procedures adhered to standards.
- Demonstrated project management skills, devised, and organised project vehicle test schedules and resources.
- Actively monitored progress and developed a well-designed Gantt Chart to adhere to a three-month deadline.
- Confident communication when liaising with customers, suppliers, work technicians and colleagues.

KATC AutoTrans Pte Ltd: Singapore – Intern Mechanic (June 2017 – August 2017)
A leading automatic transmission specialist vehicle repair garage in Singapore.

- Performed fault analysis on vehicles using diagnostic tools.
- Disassembled affected area of fault, repaired/replaced faulty components, and re-assembled area.
- Transmission rebuilds: Overhauled automatic transmissions, specific to Mercedes Benz Vehicles.

Ngee Ann Polytechnic Students' Union 34th Executive Committee: Singapore – Honorary Financial Secretary (September 2015 – August 2016)
A non-profit organisation aimed to promote and safeguard the interests of the polytechnic's student body.

- Managed financial accounts for the polytechnic's 8 academic schools and the Union's funds and budgets.
- Directed a committee to plan, organise and execute large scale school social events and major camps (e.g., Freshmen Orientation Camps involving 500 participants, graduation ceremony).
- Liaison for suppliers and polytechnic's student development advisors for major school events.

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages:** Fluent in English (Native) and conversational Mandarin. (Chinese)
- **IT Skills:** Proficient in Solidworks CAD & PDM, ADAMS MBD, AVL Boost, MATLAB, VX Elements 3D scanning, Racelogic, Microsoft Office and Microsoft Project. Competent in Cosworth PI Toolbox, Ncode Glyphworks, Microsoft Visual Studio.
- **Practical Skills:** Experience with workshop machinery and laboratory operations. Manufacturing experience of drilling, turning, milling, grinding, welding and sheet metal fabrication. Ability to produce, read and fabricate components from engineering drawings. Knowledge on vehicle systems and vehicle test rigs.
- **Leadership Roles:** Vice-President of the Mechanical Engineering Academic Club Ngee Ann Polytechnic. Led and worked with members to organise programmes for the School of Engineering and student course representative liaison.
- **Individual Interests:** Car mechanical repairs and currently rebuilding a single-cylinder Honda GX200 engine. Enjoy motorsport racing events such as F1, BUKC, BKC and 24 Hours of Le Mans. Enjoy hobbies such as golf, rock climbing, indoor karting, and figure skating.
- **Clubs & Memberships:** Scrutineer Volunteer at Motorsport UK. Affiliated Member of the IMechE. Member of Oxford Brookes Karting Society.

Dominic Howe

+44 0789 8983691 Dominic.Howe@cranfield.ac.uk

Cranfield University

PERSONAL STATEMENT

A hard working technically minded engineer seeking an opportunity within the motorsport sector. Currently studying a MSc in Advanced Motorsport Engineering at Cranfield University, after having graduated with a First in Mechanical Engineering from De Montfort University. Wide range of experience, through employment in hospitality and retail, with racing experience obtained through Formula Student. Undertook a wide range of projects and tasks with Formula Student during bachelor's degree, gaining teamwork, leadership and communication skills through education and work experience.

KEY ACHIEVEMENTS

- Achieved 87% for final year project during bachelor's degree, producing a weight saving of over 7% for the differential carrier, as well reducing the Formula Student car's unsprung mass by including a rear inboard brake.
- Attained a First-class degree in Mechanical engineering.
- Produced the university's most powerful Formula Student car to date.

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, Cranfield, UK (October 2020 - Present)

Modules: Motorsport Powertrains, The Business of Motorsport, Motorsport Aerodynamics, Motorsport Electronics and Data Acquisition, Motorsport Structural Analysis, Motorsport Vehicle Dynamics, Computational Fluid Dynamics for Motorsport, and Composite Structures for Motorsport.

Group Design Project: Corona Charge – Design of an electric sports racing car powertrain for a new proposed series.

Individual Thesis Project: To be confirmed

BEng Hons Mechanical Engineering, (First): De Montfort University, Leicester, UK (September 2017- June 2020)

Year 3 Modules
Dynamics and Control (90%), Solid Mechanics (75%), Plant Analysis and Sustainability (83%), and Individual Project (87%).

Year 2 Modules
Theory of Machines and Thermodynamics (84%), Project Management (84%), Advanced Engineering Mathematics (92%), Product Design and Development (74%), and Strength of Materials (88%).

Year 1 Modules
Engineering Mathematics (94%), Electrical and Electronic Principles (60%), Mechanical Principles (89%), Principles of Design and Manufacture (78%), and CAE and programming (75%).

CAREER HISTORY

Chelmsford City Racecourse: Chelmsford, UK - Hospitality Steward (May 2018-Present)

- Ensuring only permitted people are allowed into certain areas: requiring diplomatic communication.
- Dealing with ticket scans and enquiries: providing customer service.
- Dealing with owners and trainers: client communication in a business-to-business environment.
- Dealing with queries and problems of customers: requiring a friendly and approachable manner.

Formula Student Project DMU: Leicester, UK – Volunteer (October 2017 – July 2020)

- Manufactured parts – such as a makeshift steering column.
- Designed parts using Creo – including a gear shift paddle and fuel cell.
- Performed car maintenance – for example wheel alignment and changing brake disks.
- Completed track testing – for instance leading a brake test.
- Undertook 2019-20 powertrain and rear braking system for individual project.

Chelmsford Star Cooperative: Chelmsford, UK – General Assistant (November 2015 – September 2017)

- Provided excellent customer services: dealing with face-to-face enquiries, complaints, and refunds.
- Handled cash and processed electronic payments, ensuring customers got charged correctly and any applicable discounts were applied: ensuring attention was paid to detail.
- Ensured product knowledge was up to date to promote sales and help customers locate products.
- Carried out stock checks: needed to be organised.

SKILLS, INTERESTS AND EXTRACURRICULAR ACTIVITIES

Teamwork

- Demonstrated at university through group projects such as building an egg deploying cable car.
- During employment worked as part of teams varying in sizes, from 2 to 10 people.
- Played team sports throughout life such as football and cricket, putting skills into a different setting than work.

Technical Skills

- Microsoft Office: Word, PowerPoint, Excel, Access, and Outlook developed through education.
- Knowledge of using MATlab, Simulink, Pi Toolbox, PTC Creo, Ansys, Abaqus, AVL Boost, Altair Hypermesh and Autodesk Simulation gained at University and SolidWorks at school – recently creating an Oil Pump in Creo.
- Use of workshop machines such as pillar drills, bandsaws, sand belts, and hand tools at both school and university.

Written and Verbal Communication

- Led school tours for prospective students and parents as a prefect.
- Dealt with customers in both retail and hospitality sectors.
- Produced written reports for both individual and group projects at university, recently for a Beam Deflection experiment achieving 90%.
- Presented to peers and lecturers at university as part of projects.

Leadership

- Team leader of group projects during undergraduate course.
- Principal altar server, whereby other altar servers were appointed roles for the mass.
- Organised fundraising events for charities.

Interests

- Enjoy watching and playing a variety of sports. Have been fortunate enough to attend a range of motorsport events from Grasstrack racing to the British Grand Prix, as well as events such as Goodwood Festival of Speed and Silverstone Classic.
- Avid football fan and have held a season ticket for Ipswich Town F.C. in recent seasons.
- Member of university's rowing team and Formula Student team, with whom final year project was undertaken.
- Enjoy going for drives, bike rides and country walks.
- Member of Chelmsford Motor Club.
- Associate member of the Institution of Mechanical Engineers.

Théo Mandé

+33 622 610 654 t.mande@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

Postgraduate student in Advanced Motorsport Engineering at Cranfield University. Great interest in motorsport and automotive engineering driven by passion and with 4 years of experience gained in high performance automotive related projects. Strong analytical and problem-solving skills acquired in a professional environment that developed an enthusiastic and ambitious state of mind. Previous academic and work experience enhanced development of strong communication skills. Native French and fluent in English, and Spanish.

KEY ACHIEVEMENTS

- Managed and delivered a complete powertrain calibration project (Alpine A110 - 2021) as part of an MSc thesis with Renault Sport Cars. Grade 37/40.
- Awarded internship's best oral presentation - First Honours – Bachelor of Technology 2016.
- Started working at the age of 16 in Spain to develop a strong sense of rigor and responsibility.

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, Cranfield, UK (October 2020 - September 2021).

- **Modules:** Aerodynamics and Computational Fluid Dynamics for Motorsport. Motorsport Powertrain Design. Vehicle Dynamics. Motorsport Electronics and Data Acquisition. Motorsport Structural Analysis. Composite Structures for Motorsport. Business of Motorsport.
- **Group design project:** Subject to be confirmed.
- **Individual thesis:** Individual master's thesis to develop a motorsport engineering topic in depth, wishing to devote my research on an aerodynamic-related project.

MSc Mechanical Engineering: CESI Ecole d'Ingénieurs, Paris, France (September 2017 - September 2020).

- **Education**: Completed a work-study program at RENAULT Sport Cars. Relevant course method using the PDCA (Plan, Do, Check, Act) learning method which brings a scientific approach to make improvements.
- **Thesis project** : Euro-6 engine OBD calibration for the Alpine A110 (Gasoline, 1.8L, turbocharged).

B.Tech. (Bachelor of Technology): Lycée Jacquard, Paris, France (September 2014 - September 2016).

- **Modules:** Mechanical Engineering, Automation Engineering Technology, Electricity and Electronics.
- Second-class honours, (2:1).

CAREER HISTORY

RACING EXPERIENCE, Luxembourg, LU - Race mechanic volunteer (February 2020 - Present).
Volunteering work experience: Michelin Le Mans Cup (LMP3).

- Carried out car set-up, aerodynamics adjustments and pit stop member during race weekend.
- Garage assembly, tyre cleaning.

RENAULT SPORT CARS, Les Ulis, FRANCE - Apprenticeship (October 2017 - September 2020).
Automotive manufacturer - Engine Calibration Engineer.

- Engineering intern in the engine tuning department for 3 years.
- Developed skills in engines control algorithm and software, CAN vehicle communication system.
- Led a complete powertrain tuning project to comply with Euro 6d emission & OBD regulations.
- Managed the engine calibration validation process for the Alpine A110 project.

FEV Europe GmbH, FRANCE - Engine emission test bench operator (September 2016 - September 2017).
Powertrain development and engineering services.

- Operated and analyzed engine emission tests in laboratory. NEDC & WLTP Euro 6 emission test cycle.
- Created methodology and process to perform extreme conditions test during 2-shift schedule.

LE CAPITAINE INDUSTRIE, Saint-Lô, FRANCE - Internship (February 2016 - March 2016).
Automotive Manufacturer - Manufacturing Engineer Assistant

- Placed within the Manufacturing department of LE CAPITAINE to work with a new storage and supply chain system, to enable over 20 factory workers to operate during 2-shift and 3-shift schedule.
- Achieved a two-month internship in a production factory putting in place Lean manufacturing and stock management procedures (KANBAN and 5S).

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Soft skills:** Public speaking, Critical analysis, Adaptability (living environment, culture), and Teamwork.
- **IT Software:** SolidWorks, CATIA, STAR-CCM+, Ansys Fluent, MATLAB/Simulink, AVL Boost, AVL Concerto, ETAS Measure Data Analyzer, INCA, Pi Toolbox, LaTeX, Microsoft office.
- **Sport:** Football (competition level), Snowboarding and skiing (6 years),Gym, trekking and running.
- **Languages:** English (professional working proficiency), French (native), Spanish (fluent).
- **Motorsport** enthusiast (Formula1, Endurance WEC, Touring and GT cars, Moto GP, Rallycross).
- **Online gaming:** Formula One simulation racing, sport competition games.
- Video content creator (Sport events, Holidays, personal staging).
- **Reading** technical motorsport and automotive books:
  Race Car Aerodynamics: Designing for Speed by Joseph Katz, Ph.D. (2006).
  How to Build a Car by Adrian Newey (First published in 2017).
  Automotive Handbook (2nd edition) by R. BOSCH GMBH (2000).
  Race Car Design by Derek Seward (First published 2014).

Ovidiu Mihailescu

+40 (0) 735181322 o.mihailescu@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

A perseverant and problem-solving candidate with a heavy interest in motorsports and automotive innovation. Seeks performance both on a personal level and in the field of vehicle engineering. Achieved great communication skills in multiple languages and strong theoretical and practical knowledge during international academic activities and work. Secured good organizational skills and a flexible approach due to strict deadlines. Obtained valuable experience in motorsports through volunteering as a data engineer in the British F4, involvement in the modelling and simulation of an LMP3 car, the collaboration with a Formula Student team for the Bachelor's thesis and due to various practical assignments during MSc. course. Driven to take on new challenges and motivated to succeed by always striving to be better. Is focused mostly on the following subjects: modelling, simulation, control systems, programming, data engineering and vehicle dynamics.

KEY ACHIEVEMENTS

- Got involved with British motorsports by volunteering on the pit wall and as an F4 data engineer.
- Modelled and simulated the suspension components, tyres and full vehicle dynamics of a future vehicle in the Garage56 class of the LeMans endurance race in 2023 within a student team
- Collaborated with the Formula Student team in Eindhoven, Netherlands modelling the electric motors used on the URE cars and finding performance improvements, potentially increasing the peak mechanical power by 33-47%
- Graduated an international Bachelor's in Automotive Technology with First Class Honours
- Prepared and modified own vehicle for amateur track day use and driven it on Zandvoort Circuit

EDUCATION

MSc. Advanced Motorsports Mechatronics: Cranfield University, Cranfield, UK (October 2020 - September 2021)

- **Modules**: Mechatronics Modelling for Vehicle Systems, Advanced Control and Optimization, Embedded Vehicle Control Systems, Vehicle Control Applications, Motorsport Electronics and Data Acquisition, Motorsport Vehicle Dynamics, Business of Motorsport, Motorsport Powertrains Design, Introduction to Motorsport.
- **Group Projects**: F1 Design Sprint – Modelling of 1.6 turbocharged F1 engine in AVL Boost for realistic performance; Corona Charge – Design of electric racecar for a new Formula E support race series.
- **Individual Thesis**: Feasibility study of single-axle torque vectoring on AWD electric vehicle through modelling and simulation for the optimal number of electric motors.

BSc. Automotive Technology (1st): Eindhoven University of Technology, Eindhoven, Netherlands (September 2017 - August 2020)

- **Modules**: Road Vehicle Dynamics, Electric and Hybrid Vehicle Powertrain Design, Vehicle Networking, Automotive Sensing, Electromechanics, Electromagnetics, Control Systems, Signal processing, Computation, Technology Entrepreneurship, Data Analytics, Mathematics, Physics.
- **Group Design Projects**: Exploration robot programming, Automotive Energy Challenge, Design of Electronic Differential, Wireless Charging Design.
- **Individual Thesis**: Geometric Optimization of Surface-Mounted Permanent Magnet Synchronous Machines for Formula Student Applications' - in collaboration with University Racing Eindhoven (URE). The thesis aims to investigate improvements of the electric motors used for the URE Formula Student racecar from a winding configuration and a slot number point of view through modelling and simulation.

Extra Course: Motorsport Wheel Alignment Fundamentals – RaceCraft Ltd. (February 2021 – March 2021)

- **Modules**: Basics of Suspension Design, Wheel Alignment Terminology, Adjustable Alignment Hardware, Tire Pressure, Alignment Equipment, Practical Skills, Analyzing Alignment at the Track.

Extra Course: Practical Corner Weighting – RaceCraft Ltd. (February 2021 – March 2021)

- **Modules**: Corner Weighting Concepts, Corner Weight Equipment, Practical Skills, Assessing the Car.

CAREER HISTORY

JHR Developments: United Kingdom - Volunteer British F4 Junior Data Engineer (March 2021 -)
Founded in 1995, JHR is a British racing team that has taken part in several single-seater and sportscar series.

- Managed data logs and footage for 4 cars after each session, helped diagnose problems through data analysis
- Recorded car vitals after every test session and kept track of weather conditions and temperatures

EUFLEX: Eindhoven, Netherlands - Teaching Assistant for Data Analytics (February 2020 - April 2020 and January 2019 – May 2019)
Founded in 1998, EUFLEX is a wholly owned subsidiary of the Eindhoven University of Technology which connects professionals and talented students with start-ups and companies and manages student jobs at the University.

- Supervised first-year students and grading practical assignments for the Data Analytics course at the Eindhoven University of Technology
- Expanded students' understanding of data analysis methods and Python programming language, achieving a 90% passing rate in submitted assignments

EUFLEX: Eindhoven, Netherlands - Lab/Teaching Assistant for Spectrum of Automotive (September 2019 - November 2019)

- Led practical experiments and provided theoretical support within the Spectrum of Automotive course at the Eindhoven University of Technology for first-year students
- Guided more than 100 Automotive students during practical tasks such as measuring centre of mass of vehicles, dismounting and reassembling engines and transmissions
- Answered questions and provided practical insight regarding suspension systems and wheel geometry

InMotion: Helmond, Netherlands - Vehicle Dynamics Engineer (October 2018 - October 2019)
InMotion is a Dutch student team formed in 2009. While previous projects have been building the first bio-ethanol racecar in the country followed by an electric one, the primary focus is now designing and building a fully electric Garage56 endurance racecar, able to fast recharge its batteries in only 2 minutes.

- Modelled tyres and full vehicle model of the future racecar in MATLAB/Simulink for lap time calculation purposes
- Modelled and simulated the suspension behavior for determining the correct damping and spring rates for the application in MATLAB/Simulink
- Collaborated with students from various engineering backgrounds, levels of experience and cultures towards a common goal
- Performed under pressure, delivering results under strict deadlines dictated by the management or external partners

Domino's Pizza Netherlands: Eindhoven, Netherlands - Deliveryman (December 2017 - September 2018)
Domino’s Pizza Netherlands is a franchise of Domino’s Pizza Enterprises LTD since July and is currently the largest pizza delivery company in the Netherlands with 206 opened stores.

- Delivered both hot and cold food products by electric bike in Eindhoven in the area operated by the Domino’s Woenselse Markt in less than 20 minutes per order

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages**: Native Romanian speaker with professional fluency in English, a good command of German and basic proficiency of Spanish
- **IT Skills**: Good knowledge of specialized simulation software such as MATLAB/Simulink, AVL Boost, Cosworth Pi Toolbox, MoTeC i2, VBOX CircuitTools, LifeView, Arduino, Altair Flux/Fluxmotor, CodeBlocks, Gimp; experienced in C/C++ programming; basic proficiency in Python; experience in writing papers in LaTeX; good command of Microsoft Office software
- **Individual Interests**: Motorsports, modifying own car and going to track days, car modelling, basketball, longboarding, snowboarding, gaming, international travel, photo manipulation
- **Clubs and Memberships**: RaceCraft Gold Member, ex-member of Special Combat Airsoft Regiment (SCAR) club, ex-vocalist of Beyond Level Zero and Epileptic Outbreak metal bands

John Moffat

+44 (0) 7970 139446 johnmoffat@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

A creative and energetic leader who has extensive experience leading teams and mentoring colleagues to deliver results across sectors and within complex environments, including conflict zones. Extensive experience of working with people from different cultures and backgrounds including technical experts, international, government and non-governmental organisations. Currently undertaking a Postgraduate qualification in Motorsport Engineering.

KEY ACHIEVEMENTS

- Building the Origami Energy Operations team into a high performing, revenue generating capability.
- Team won 'Utility of the Year Award 2015' from Smart Metering and Grid conference held at St Paul's, London and 'Best Innovation Award' at Scottish Renewables Green Energy Awards for innovative work on the ARC project.
- Awarded 'We Always Think Big' prize for creating a tool to improve operational awareness and decision making during a crisis subsequently adopted into SP Energy Networks business as usual.
- Commissioning as a Royal Marines Officer and serving country in the Northern Arabian Gulf, Iraq, Afghanistan and Middle East during the Arab Spring uprising.
- Built and raced a Tomcat off-road racer for Safari racing in All Wheel Drive Club.

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, Cranfield, UK (October 2020 - Present)

- **Modules**: Composite structures for motorsport, Computational fluid dynamics for motorsport, Motorsport aerodynamics, Motorsport electronics and data acquisition, Motorsport powertrain design, Motorsport structural analysis, Motorsport vehicle dynamics, The business of motorsport.
- **Group Design Project**: Design an open cockpit electric sportscar for international championship events.
- **Individual Thesis**: Design a structural sandwich panel with battery cells as the core.

MDA Master's Defence Administration (Executive Course): School of Management, Cranfield University, UK (February 2005 - July 2009)

- **Modules**: Defence Acquisition and Logistic Support, Management of Information Systems, Management Science, Organisational Behaviour, Strategic Management in the Defence Sector, Marketing, Financial Management and Accounting, Defence Economics, Leadership and Change Management, Human resource Management, Project Management and Security and Governance.
- **Individual Dissertation**: Evaluate the utility of Stabilisation Unit as an operational instrument for Civilian Military Cooperation (CIMIC) and to identify any short comings.

BEng (Hons) Mechanical Engineering and Computer Aided Engineering (2:2): Heriot Watt University, UK (October 1991 - July 1995)

- Won Robert Airy Award for Excellence in Applied Mechanics.

CAREER HISTORY

Career Break: (September 2017 - September 2020)
Assumed primary parental responsibilities for our two young children to support my wife's career goals.

- Established own business to research electric vehicles for low volume manufacturing.
- Volunteered at Community school as Co-Chair of Governors overseeing strategy and school finances.

Origami Energy Ltd: Cambridge, England – Operations Manager (August 2015 - August 2017)
An innovative technical small, medium enterprise (SME) with the goal to disrupt the energy sector worldwide through the vision to: 'Create the real time market-place for the distributed energy world'.

- Designed and recruited full Operational capability of Origami Energy from ground up including: Validation, Enablement, Delivery of Services, Customer Care, Billing and Settlement, Reporting and Health and Safety.
- Recruited and empowered the Operational team to enable 20MW of flexibility turning Origami into a revenue generating business.
- Authored the Operations Handbook identifying working principles, business rhythm and expected behaviour resulting in clear expectations for leaders, team members, suppliers and consultants.
- Mentored colleagues that included instigating a staff well-being survey designed to promote best practice teamwork across the business.
- Initiated a monthly 'book club' using HBR articles and TED talks amongst other material to develop leadership skills.
- Achieved company-wide milestones on time and on budget to support second and third round fundraise events securing £18M evergreen VC funding.
- Commissioned independent review of Origami Operations from respected Cambridge University Institute of Manufacture with very positive results.
- Facilitated business development with strategic and channel partners together with business-to-business customers.

SP Energy Networks: Glasgow, Scotland – Knowledge Transfer Lead (August 2013 - April 2015)
A Transmission Asset Owner (TO) and Distributed Network Operator (DNO) responsible for the Transmission and Distribution of electricity to 3.5M customers in two licensed areas covering Scotland, England and Wales.

- Headed business capability for 'importing' learning from other DNOs to realise the benefits of innovation projects into SP Energy Networks and exporting knowledge under the Low Carbon Network Fund initiative (LCNF) by working closely with external stakeholders.
- Analysed and improved the Knowledge Dissemination Strategy and evaluated projects against KPIs to demonstrate benefits had been provided at scale into business as usual.
- Headed knowledge management aspect of project Accelerating Renewables Connections (ARC) valued at £8.4M aimed at connecting renewable generation to the distribution network quicker.
- Spearheaded peers from UK Energy Networks Association working group on planning and holding the Gas and Electricity, Distribution and Transmission Innovation conference.

Royal Marines Commando: Worldwide - Major (April 1996 - April 2013)
The UK's amphibious and cold weather warfare specialists.

- Led small teams during 'Arab Spring' uprising to obtain critical information and inform UK PM and POTUS decision making on rapidly changing circumstances.
- Conducted contingency planning for the UK response: to Haiti disaster relief, ash cloud travel chaos and intelligence derived terrorist attack.
- Lead member of the Civilian Planning Cell within a large NATO military Headquarters preparing to deploy to Afghanistan.
- Seconded to UK Government department and led the Stabilisation team that deployed to hostile areas, improved local livelihoods, isolated insurgents and shaped evolving UK policy on stabilisation operations.
- Commanded the first multinational civilian/military team providing stabilisation in Helmand Province, Afghanistan.
- Commanded 214 people as part of 3 Commando Brigade Medical Squadron on operations in Iraq.
- Spearheaded small team boarding operations from various Royal Navy ships in the Northern Arabian Gulf in support of United Nations Security Council Resolution 665.

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Memberships:** Associate member of the Institute of Directors (IoD).
- **Professional/Technical training:** Advanced Planner, Facilitator and Media Operations.
- **Off-road racing**: Built and raced a Tomcat off-road racer in the All-Wheel Drive Club.
- **Individual Interests**: Triathlon, rugby and playing the bagpipes.
- **Volunteering:** Former Co-Chair of Governors at local Primary School. Former helper at St Joseph's hospice in Rawalpindi, Pakistan.

Steven Rijns

+31 6 42032215 steven.rijns@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

An innovation minded candidate with a combined mechanical and motorsport engineering knowledge base. Possesses strong design, modelling, optimisation and problem-solving skills developed over multiple projects such as F1 Design Sprint. Skilled communicator and collaborative team leader backed up by experience in working in teams and cross-cultural environments due to studying abroad. A native Dutch and fluent English speaker with perseverance and driven to achieve the best engineering solutions.

KEY ACHIEVEMENTS

- Characterised the response of a robotic system and implemented a control system to realise the required dynamic behaviour while satisfying stability and robustness constraints.
- Designed and built a heads-up display integrated into a helmet to enable hearing impaired/deaf race car drivers to receive mission critical instructions.
- Simulated the power split of a hybrid electric vehicle to minimize emissions using Matlab.
- Modelled and optimised performance of a naturally aspirated as well as a turbocharged 4-cylinder engine in AVL BOOST.
- Performed multiple experiments to achieve maximum aerodynamic efficiency on a race car in a moving ground wind tunnel.
- Conducted CFD simulations to optimise a Formula 1 front wing.

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, Cranfield , UK (October 2020 - September 2021)

- **Modules:** Motorsport Powertrain Design, Motorsport Electronics and Data Acquisition, The Business of Motorsport, Motorsport Aerodynamics, Computational Fluid Dynamics for Motorsport, Motorsport Structural Analysis, Composite Structures for Motorsport, Motorsport Vehicle Dynamics.
- **Group project:** Design of a New Electric Race Car for a Formula E Support Series
- **Individual Thesis:** Induced Drag Reduction Method on a Rear Wing

BSc Mechanical Engineering: Eindhoven University of Technology, Eindhoven, NL (September 2017 - August 2020)

- **Modulus:** Product Innovation Processes, Data Analytics for Engineers, Calculus, Applied Physical Sciences Flows, Signals and Systems, Mechatronic Design, Design Principles, Dynamics, Analysis of Production Systems, Thermodynamics, Mechanical Engineering and Truss structures, Dynamics and Control of Robotic Systems, Computer Aided Engineering, Structure and Properties of Materials, Solid Mechanics, Computational Mechanics, Heat and Flow, Mechanics, Transport Phenomena, Model-Based System Engineering.
- **Projects:** Electric and Hybrid Vehicle Powertrain Design, Energy Management, Combustion Engine, Robot-arm, Peristaltic Pump, Solar Heat System, Mechanical Design Project, Engineering Design.
- **Individual Thesis:** Influence of Different Powertrain Designs on the Efficiency of Electric Vehicles

CAREER HISTORY

F1 Design Sprint: Cranfield University, UK – MSc Student (November 2020 - December 2020)
Student-led extra-curricular activity focused on simulation of the Formula 1 2020 Powertrain in AVL BOOST based on manufactures input. Aimed to improve the combustion, turbocharger and ERS modelling over previous year's model, and investigate different tuning methods.

- Designed a more realistic compressor map, turbine curve and intercooler to improve performance, which enabled less aggressive tuning of the engine.
- Re-modelled the MGU-H which can recover energy from the turbine as well as power the compressor dependent on the wastegate throttle position.
- Investigated multiple energy strategy modes to use in different racing situations by changing the wastegate throttle position. This included a maximum energy recovery mode, a maximum energy deployment mode, and interpolation between the two for potential other modes.

Influence of Different Powertrain Designs on the Efficiency of Electric Vehicles: Eindhoven University of Technology, NL – BSc Thesis Project (April 2020 - July 2020)
Bachelor Thesis aimed at studying the effect of different powertrains on the performance and overall efficiency of multiple electric powertrain topologies.

- Performed extensive Matlab modelling and simulation of single speed, dual speed and CVT transmissions in combination with one and two electric motors.
- Designed optimisation algorithms for the electric motor sizes, gear ratio values and shift speeds for all topologies to achieve the maximum overall energy efficiency over the WLTP drive cycle. The two electric motor topologies also included optimisation algorithms for the power split between the two motors.
- Recommended the optimal configuration for one and two electric machine topologies to achieve maximum overall energy efficiency.

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages:** Fluent Dutch and English, intermediate German
- **IT Skills:** Experienced Matlab user as well as Simulink, CAD (NX and CATIA), Marc/Mentat, NX Advanced FEM, HyperMesh, AVL BOOST, Ansys Fluent, MS Office
- **Individual Interests:** Motorsport, high performance vehicles and engineering in general. Enjoy kitesurfing, skiing and working out.

Zhi Yong Tey

+44 (0) 7493641193 Z.Y.Tey@Cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

Mechanical engineer graduate with a passion for motorsport. Currently studying MSc in Motorsport at Cranfield University to develop sector skills to turn interest into useful knowledge to apply to real-world situations. Primary academic experience focused on manufacturing and material technologies with experience with 3D machining. An organized individual, capable of working under pressure and tight deadlines accurately. Enjoy working hand on either on repairing on a car or building something from the from the ground up.

KEY ACHIEVEMENTS

- Built a home-made hydrogen and oxygen generator with electrolysis. Installed the system into a car to improve efficiency of the engine. Completed as personal side project during high school.
- Designed and built an internal mini elevator system to climb up and down in a pipe. Achieved during first year undergraduate group project.
- Completed a final year dissertation about materials and manufacturing selection for electric vehicle battery casing and awarded with first class overall (71%).

EDUCATION

MSc Advance Motorsport engineering: Cranfield University, Cranfield, UK (October 2020 - September 2021)

- **Modules:** Motorsport Electronics and Data Acquisition, Composite Structures for Motorsport, The Business of Motorsport, Motorsport Aerodynamics, Motorsport Vehicle Dynamics, Motorsport Powertrains, Computational Fluid Dynamics for Motorsport, Motorsport Structural Analysis
- **Group project:** Assigned to work on the chassis development for a electric sports car championship events.
- **Thesis:** TBA

Beng Mechanical Engineering with first class honor's: Northumbria Uni, Newcastle, UK (September 2017 - June 2020)

- **Modules:** Sustainable Energy system, Advance structural system, Advance Manufacturing System, Mechanical design & analysis, Engineering management and economics, Energy system, Fluid system, Manufacturing technology, Materiel Engineering, and Performance.
- **Dissertation:** How material and manufacturing selection for battery casing can impact on environment

CAREER HISTORY

HanaHana: Newcastle - Food and Beverage Assistant Food and Beverage Assistant (May 2019 - March 2020) A teppanyaki Restaurant

- Delivered customer food and beverage. Responsible for food and drink arrive to the right customer and communicating with staff every orders and task.
- Managed and trusted with handling large amount of cash and responsible for retaining stock as well. Led and trained a trainee demonstrate a good work ethics.

Heap Seng Auto Service: Malaysia - Part time mechanic assistance (January 2016 - January 2017) Bosch workshop servicing all kind of vehicles. Specializing on restoring and servicing classic Mercedes and partnership with Mazda.

- Performed oil change, wheel alignment, and tyre changes for customers, supporting team to ensure vehicles were ready in allocated timeframe.
- Managing stock order and organize to keep track on stock quantity.
- Ensuring a safe and clean working environment by organize tool, checking if tool are safe to operate, and keeping floor shop clean.

Gleneagles Hospital: Malaysia - Marketing Team (May 2017 - June 2017)
Gleneagles Hospital Kuala Lumpur is currently the leading private hospital in Malaysia's metropolitan capital.

- Promoted Minimal Invasive Surgery within the hospital. Put up posters and spoke with visitors and patients, explaining the benefits of the keyhole surgery methods to increase awareness and uptake.
- Completed demonstrations of equipment for the surgery.

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Clubs:** A affiliated committee of Malaysian society at Northumbria uni. Organised activities for students, such as sports day and ensured the event ran smoothly along with help of another member.
- **Sport:** BUCS ultimate frisbee at university and achieve 7th place 5-a-side at a game organize at Edinburgh. Participated in a few games of Basketball. Recently picked up golf
- **Volunteer:** Volunteered at an event Bring it On 2019 The North East Exhibition for Future Engineer. Bringing young kids to exhibition and showcasing all kinds of cool machines and robots
- **Interest:** Occasionally go-kart, cooking and fitness, and boardgames

Javier Vargas Quintana

+44 07709 208885 j.vargas-quintana@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

An innovative and forward-thinking postgraduate student with combined interests in the motorsport and automotive industry. Exhibits communication, mathematical, teamwork, and analytical skills reinforced with a strong academic background, noticeable know-how due to several international projects within the automotive industry and “hands-on” experience in Formula Student competitions. A native Spanish and fluent English speaker, driven individual who possesses the right skills to accomplish effectively in a team environment at a high level. A curious, tenacious, and motivated individual with a hunger to work in a fast-paced environment, persistent in delivering the highest standards with a passion to succeed within the motorsport and automotive industry.

KEY ACHIEVEMENTS

- Bachelor thesis with Honours: “Lap Time Simulations for the CAT12e Formula Student Racing Car”
- 3rd Overall position in Formula Student Czech Republic 2018 with ETSEIB Motorsport
- Devised a software package with the main aim of automatically changing different parameters enabling automation of a driver-in-the-loop session, saving considerable amounts of time and operators during sessions
- Led development of different ADAS systems: AES (Autonomous Emergency Steering) and ESS (Electronic Steering Support) and its integration in the driving simulator to conduct several tests
- Appointed as Course Representative for Advanced Motorsport Mechatronics MSc at Cranfield University
- Recognized for fluency of English language with Certificate in Advanced English from Cambridge Assessment English
- Received the Canary Islands High School Award in 2015, for being one of the top 5 students

EDUCATION

Advanced Motorsport Mechatronics MSc: Cranfield University, Cranfield, UK (October 2020 - Present)

- The course aims to provide a sound understanding of the fundamental scientific, engineering, and managerial principles involved in motorsport. The focus is on the engineering of advanced control systems, multi-domain computer modelling, in-vehicle communication networks, electromechanical and embedded systems, hardware-in-the-loop validation and systems integration. It also covers the design, testing and operation of competition vehicles, and related aspects of control engineering, computer modelling, embedded systems, alongside vehicle dynamics, vehicle systems, and management techniques related to motorsport.
- **Modules:** Electronics and Data Acquisition, Vehicle Dynamics, Vehicle Control Applications, Motorsport Powertrains, Mechatronics Modelling for Vehicle Systems, Advanced Control and Optimisation, Embedded Vehicle Control Systems and Business of Motorsport.

Industrial Technology Engineering BSc: Polytechnic University of Catalonia, Barcelona, Spain (September 2015 - February 2020)

- Bachelor Thesis with Honours: “Lap Time Simulations for the CAT12e Formula Student Racing Car” The thesis aims to develop a modelling and simulation package of the ETSEIB Formula Student using CarMaker and Simulink
- **Group Project:** member of the Formula Student team ETSEIB Motorsport at UPC, during two seasons, designing and constructing two single-seaters cars in the Powertrain and Vehicle Controls System departments, with the main aim of building a Formula Student race car to compete around Europe.
- **Modules:** Mathematics, Informatics, Engineering Drawing, Chemistry, Differential Equations, Electromagnetism, Materials, Numerical Methods, Mechanics, Advanced Mechanics, Economics and Business, Machines and Mechanisms, Project I, Statistics, System Dynamics, Continuum Mechanics, Electrical Engineering, Environmental Technology and Sustainability, Statistical Techniques for Quality, Technology and Selection of Materials, Thermodynamics, Electrical Machines, Fluid Mechanics, Optimization and Simulation, Organization and Management, Project II, Strength of Materials, Automatic Control, Electronics, Heat Transfer, Manufacturing Systems and Project Management.

CAREER HISTORY

Applus+ IDIADA Automotive Technology: Tarragona, Spain - Vehicle Dynamics and Driving Simulator Engineer (October 2019 - August 2020)

Applus+ IDIADA is an automotive company that offers design, testing, engineering, and homologation services to the automotive industry worldwide. It has more than 2750 engineers and technical experts, and an international network of subsidiaries in 24 countries. The Vehicle Dynamics department consists of more than 10 engineers of different nationalities working on international projects. Some of the technical tasks developed:

- Managed the development of different ADAS systems. Systems were developed and implemented in a MATLAB and Simulink environment and integrated into the driving simulator to conduct several tests
- Headed the development of a software package with the main aim of automatically change different parameters enabling the automation of a driver-in-the-loop session, saving considerable amounts of time during the session
- Led the development and tuning of a set of Active Systems, such as Torque vectoring and ABS in a MATLAB and Simulink environment, and integration into the Driving simulator environment
- Performed a design review of a production car with the main aim of improving the cornering stability, the output of the project was a final value of the stability metric 20% better than the initial target
- Executed a vehicle dynamics set-up a refinement of the anti-roll bars, springs and dampers for a passenger vehicle in the final stages of testing, the outcome of the project was a set of vehicle dynamics performance metrics at least 15% better than the initial targets

ETSEIB Motorsport: Barcelona, Spain - Control Systems Engineer (September 2018 - September 2019)

Member of the Vehicle Control Systems department focused on developing a lap time and vehicle dynamics simulator (IPG-CarMaker), as well as torque vectoring system algorithm specifically created for the first four-wheel-drive formula student car of the history of ETSEIB Motorsport, this technology development leads to an astonishing improvement of the car performance. Some of the technical tasks developed through the season:

- Headed the improvement of the vehicle dynamics behaviour of the car with simulations of the different Formula Student dynamic events: acceleration, skidpad, autocross and endurance
- Produced a problem detection methodology during testing with test track data analysis leading to a significant vehicle performance enhancement, as a result of these activities the team was able to finish all Formula Student dynamic events during the season
- Created a MATLAB Simulink Model for communicating with the Motor Controller through CAN

ETSEIB Motorsport: Barcelona, Spain - Powertrain Engineer (September 2017 - September 2018)

Member of the Electric Powertrain department a group of 10 students with the main aim of building a Formula Student race car to compete around Europe. Some of the technical tasks developed through the season:

- Design and CAD integration of powertrain parts in SolidWorks
- Spearheaded the development of different tests and tuning of the electric motor controller system set-up and electronics system, the result of these activities was a 12% improvement in power performance for the powertrain

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages:** Native Spanish, fluent English
- **IT Skills:** Confident IT user experienced with MATLAB, Simulink, Stateflow, IPG-CarMaker, CarRealTime, MSC Adams CAR, SimWB, GIT, SolidWorks, Dymola and Microsoft Office package
- **Memberships:** IMECHE (Institution of Mechanical Engineers, British representative of FISITA), STA (Society of Automotive Technicians, Spanish representative of FISITA)
- **Individual Interests:** Motorsport competitions, international travel, reading, running and fitness

Mª Laura Villadelprat Fontana

+34 626398666 m.villadelprat-fontana@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

Industrial Engineer passionate about Technology and Motorsport. Undertaking a double degree MSc in Industrial engineering and Advanced Motorsport Engineering.

Eager to give and receive knowledge, team worker, with the ability to lead if necessary. High learning ability, inquisitive and professional.

Engineer with high linguistic ability with professionalism in four tongues and strong technical skills with different software's and programming languages.

Undertaken two internships, the first one in an extensive international company of electronics and the second one in smaller and not international company of software.

Extracurricular activities such as repairing and restoring cars and motorcycles, and competing in swimming championships representing the colours of European International School of Barcelona.

KEY ACHIEVEMENTS

- Non-conformance material - Continental certification.
- Rework, reprocessing, and sorting - Continental certification.
- First place in a Science academic competition.
- Awarded honors in the final degree thesis – Study of electronic quality of car instrument panels.
- Fundraising for different hospitals and NGO's.

EDUCATION

MSc: Advanced Motorsport Engineering, Cranfield University, UK (September 2020 - Present)

- **Modules**: Composite structures for motorsport, Computational fluid dynamics for motorsport, Motorsport aerodynamics, Motorsport electronics and data acquisition, Motorsport powertrain design, Motorsport structural analysis, Motorsport vehicle dynamics, The business of motorsport.

- **Projects**: Participation in the F1 Design Sprint project.

MSc: Industrial Engineering, UPC - ESEIAAT, Spain (February 2019 - Present)

- **Modules**: Basic Instrumentation, Automated production and Advanced Process Control, Design and Construction of Industrial Plants and Complementary Services, Operations Management, Machine Design and Manufacturing Technology, Thermal and Fluid Engineering, Electricity Generation, Transport and Distribution Systems, Analysis and Design of Chemical Processes, Energy Technology, Architecture, Industrial Construction and Facilities, Integrated Project Management, Calculation and Design of Structures, Transport and Industrial Maintenance Engineering, Directorate of Enterprises.

Degree: Industrial Technology Engineering, UPC - ESEIAAT, Spain (September 2013 - December 2018)

- The bachelor's degree in Industrial Technology Engineering provides knowledge of the range of industrial technologies and offers a multidisciplinary, unifying view of the field of industrial engineering. Basic scientific and technological disciplines about new methods and theories and gain in-depth knowledge of industrial fields, including technological and business aspects such as project planning, supervision and management, whilst observing social and environmental requirements. Versatility to adapt to changing working environments and to future technological developments to improve products and processes in the sector.

- **Individual Thesis**: Study of electronic quality of car instrument panels - Reduce the percentage of waste in an automotive electronic circuit production plant by increasing the desired quality, productivity and efficiency. Qualification: 10/10.

CAREER HISTORY

Logitek: Rubí, Spain - Solutions Manager Internship (October 2019 - August 2020)
High-performance technological solutions in the industrial and infrastructure framework. Advice to Industrial and infrastructure market to manage the generation and exploitation of information in real time.

- Performed within the Solutions Management department improving Wonderware Iberia products and creating solutions for industrial and infrastructure manufacturers. In depth study of the potential and features of Wonderware software.

- Created an InTouch Edge HMI demo for an OEM industry.
- Highlighted for being the first intern in undertaking an InTouch Edge HMI Software project in Advanced Factories celebration in March 2020, work produced was the equivalent of what was expected of an experienced engineer.

Continental Automotive: Rubí, Spain - Electronic Quality Engineer (July 2018 - September 2019)
Continental develops pioneering technology and services for sustainable and connected mobility of people and their goods.

- Through Hole Technology appointed quality team leader. Study of Electronic PCB of automotive clusters, enhancing reliability of machinery and process optimization. Probe the scrap and reducing it over 58.7%.
- Highlighted for being the first intern to be promoted as engineer and lead an area in the quality department.

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages**: English (complete professional competence), Italian (Native), Spanish (Native), Catalan (Native), French (Basic).
- **IT Skills**: MATLAB, AVL Boost, ANSYS-Fluent, Altair HyperMesh, CATIA V6, AutoCAD, SolidWorks, Visual Basic, C++, Wonderware System Platform, InTouch Edge HMI, Advanced user of MS Office Windows and Apple (applications).
- **Teaching**: Students between 5-18 years old. Helping them with any subject from school or selectivity exams.
- **Extracurricular**: Course of assembly, configuration and flight of drones in Laboratory of Unmanned Aerial Systems (LUAS).
- **Volunteering**: Volunteered at various food banks and collecting toys campaigns for Hospital “Sant Joan de Déu”, “Creu Roja”, “Cottolengo del Padre Alegre” and “Càritas”.
- **Sports**: Synchronized swimming team: high school (2008-2010).
- **Hobbies**: Repairing and restore old motorcycles and cars. (Renault R4 and Montesa Cota 175)

Jerry Xiao

+44 (0)7762311563 jerry-xiao.xiao@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

A Mechanical and Materials engineer with life-long passion in cars interested in the sustainability and R&D aspects of motorsport. Studied and worked in three countries and developed skills to approaches problem with unique vision and diverse ideas, and quick to adapts to situations and people. Has a well-rounded engineering background, professional experience and hands-on experience in building purpose-built cars. Perceive and solve vehicle problems from an engineer and performance driver's point of view. Creative and dedicated team worker.

KEY ACHIEVEMENTS

- Designed and participated in FSAE student series recognized and featured by Loctite. Designed and built a car every year to compete in FSAE Michigan for three years. In leadership role and represented the team internationally every year. Engine team lead and lead driver, achieved top 30 on average
- Recognized and covered by Volkswagen AG and various news agencies for passion in cars. Planned and transported a custom car from Canada to the 38th Wörthersee GTI Treffen in Austria, the largest Volkswagen event in the world, held by VW AG. Drove in Europe for 12000km and 43 days before transporting to and driving 6000km in a week across North America afterwards. The car has extensive modifications including engine from another brand, all vehicle and engine work done by myself since 2015
- 2nd place in senior class at the APEGA Provincial Science Olympics finals in 2014, in Alberta Canada

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, Cranfield, United Kingdom (October 2020 - September 2021)

- **Modules:** Motorsport Powertrain, Electronics DAQ, CFD, Aerodynamics, VD, Composites, Structure
- **F1 Powertrain Design Project (Voluntary Project):**
- Co-leader in F1 Powertrain Design project team, co-managed group of 25 members in designing and optimizing a powertrain unit to 2020 F1 rules using AVL Boost software
- Developed a model and achieved realistic key performance indicators which are reviewed and approved by industry professionals. Model developed in one month, without assistance from industry professionals during design and development
- Developed and adapted Miller Cycle and Anti-Tuning technologies to the simulation model
- **Individual Thesis:** TBA (as of January 2021), proposing in research in application and analysis of Hydrogen Technology in motorsport ICE against standard fuel

Bachelor of Applied Science: University of British Columbia, Vancouver, Canada (September 2014 – June 2020)

- Graduated from the Integrated Engineering program majoring in Mechanical and minoring in Materials Engineering and completed Co-op internship program

CAREER HISTORY

Dometic Group: Richmond, Canada - Product Designer (Thermal/ MECH Engineer), Heater R&D Department (September, 2018 – May, 2019)

Dometic is a global market leader in branded solutions for mobile living in the areas of Food & Beverage, Climate, Power & Control, Safety & Security and Hygiene & Sanitation.

- Created 3D models, assemblies and technical drawings to ASME standards using CREO, Draftsight and PTC Windchill PLC systems, familiar with GD&T and manufacturing tolerances
- Planned, conducted and analyzed tests on a regular basis for various projects. Including emissions and heat output testing for fuel powered heaters, performance testing for various types of pumps and motors, product life cycle testing up to 5000 hours, pressure cycling, vibration and thermal shocking etc
- Experienced at writing engineering test reports, product and specification update notice
- Designed and constructed control circuits for a dozen of main projects, including a circuit which operated ten fuel pumps and air compressors simultaneously for 5000 hours with specified automatic on-off cycles for life cycle and durability testing
- Familiar with using various types of hydraulic and pneumatic fittings to design and construct fuel and air circuits for test setups. Used various hand and power tools to assemble components for test benches and disassemble for inspection

Formula UBC Racing SAE Team: Vancouver, Canada - Engine Team and Powertrain Integration Lead, Lead Test Driver (September, 2017 – September, 2020)
An engineering student team that designs, builds, and races a formula race car. Students build a new car from scratch annually and competes in the international Formula SAE series since 1991.

- Managed and maintained engine team related systems database (CAD, resources, reports)
- Organized and supervised engine and powertrain integration projects, average of ten projects per year
- Designed and validated GT Power engine models (2018 – 2020) to simulate performance improvements of the new intake and exhaust manifold designs
- Developed maps for the ECU on chassis dyno (18 – 20) to adapt to new engine components
- Redesigned dry sump oil system (19 – 20) to reduce engine center of gravity by 1" for improved vehicle dynamics and prevent lack of lubrication during cornering
- Designed and manufactured an intake manifold (18 – 19) based on Helmholtz and intake resonance principles. Utilized CFD analysis to solve the outer cylinders running lean issue
- Experienced at fabricating sheet metal, carbon fiber and 3D printing plastic components/molds, machining with lathe and mill, TIG welding. Not limited to engine systems
- Created over 300 parts and assemblies on SolidWorks PDM, experienced with drafting, tolerancing and material selection for manufacturing.
- Performed static and pressure FEA to ensure the durability and lightweight of components
- Improved the engine cooling performance (17 - 18) through redesigned components such as fans and radiator through data acquisition, CFD and NTU heat transfer calculations

TRIUMF: Vancouver, Canada - Challenge Project, Mechanical Engineer (September, 2016 – August, 2017)
Canada's particle accelerator centre. From hunting for the smallest particles to developing technologies, including next-generation batteries and medical isotopes. Leader in research in advance science, medicine and business.

- Designed an easy-to-use remote handling toolset for ARIEL beamline maintenance
- Created complex geometry assemblies using SolidWorks, conforming to tight space constraints and drafted engineering drawings for machine shop use
- Calculated mechanical loading and equipment sizing to meet safety standards
- Reduced the use of costly custom parts by maximizing the use of commercially available parts

Vehicle Projects – Project Planner, Designer, Technician (2011 - Present)

- Transplanted an engine from a different manufacture into my vehicle within two months through detailed planning. Vehicle performed flawlessly over the past five years of daily and track use in two continents
- Created custom engine swap wiring harnesses for four different vehicles, understand the use of proper methods of wiring connection and able to understand wiring diagrams
- Blueprinted and assembled VAG V6 and VR6, Ford V8 and Toyota i4 engines for various applications
- Fabricated custom cooling, brake, and suspension parts; participated competitively in track events

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages:** Fluent in English and Chinese (Mandarin), Basic German
- **Technical Skills:** GT-Power, AVL Engine Sim, Haltech ECU Program, SolidWorks, Draftsight, PTC CREO, RaceStudio, CATIA, ANSYS, Office, MATLAB, LabVIEW, Lathe, Mill, Superflow Chassis Dyno, Magtrol Electric Motor Dyno, Laser Cutter, 3D Printer, Hand and Power Tools, TIG Welding, Mould Making
- **Individual Interests:** Performing mechanical work, designing and fabricating upgrades for cars with friends. Creating custom parts and moulds with CAD and 3D printer. Writing on DIY vehicle work

FOR IMMEDIATE RELEASE

Contact: Barrakuda Racing

Email: media@barrakudaracing.com

Phone: +44 123456789

LOOKING BEYOND SHORE LINE: THE NEXT GENERATION OF ELECTRIC MOTORSPORT IS COMING

Barrakuda Racing sets sail with the announcement of a brand new, 'all-electric' prototype race car.

30th April 2020 – Cranfield, UK – Barrakuda Racing has broken new ground with the announcement of a new electric prototype sports car, targeted towards electrified urban racing in a potential Formula E support series. This announcement presents amateur drivers with the opportunity to enjoy electric power to its fullest in open-top machines, sporting up to 220kW of power. The vehicle is expected to launch in early 2022, with first deliveries expected towards the end of the year.

Lightness is key to Barrakuda Racing's ethos. Their innovative design incorporates an aerospace-grade, fully recyclable, aluminium space frame with state-of-the-art nanotechnology providing a greater than 30% increase in chassis strength. Paired with this lightweight chassis is an all-new electric powertrain. Utilising a modular battery design and *'Phase Change'* cooling system, Barrakuda Racing will provide flexibility for club motorsport to easily adopt electric racing technology. With this pairing, the BR21 weighs only 693kg, over 120 kg lighter than the SRT05e Gen 2 Formula E car. This makes the BR21 one of the lightest predators on the prowl, hunting down its victims with electric speed and agility.

Along with its highly recyclable design, Barrakuda Racing will incorporate sustainable natural fibre composites into the aerodynamic bodywork, reducing both manufacturing costs and the vehicle's carbon footprint. However, the fun does not stop there. At a speed of 200 kph, drivers will be able to enjoy up to 525kg of downforce, meaning the BR21 will be capable of 1.5G in corners.

This announcement comes only 6 months after the UK government announced it was bringing forward a ban on the sale of internal combustion vehicles to 2030, with many European States undertaking similar actions. As such, Barrakuda Racing are in pole position for the race to an electric future.

In addition to sweeping government regulations, club motorsport is beginning to embrace the changes. In a press release from motorsport UK, Hugh Chambers (CEO) stated:

"Innovation is a crucial area of investment if we are to deliver a sustainable future for motorsport, and clearly Electrified Vehicles are central to this."

Ben Wiles, co-founder of Barrakuda Racing, has said:

"We [Barrakuda Racing] are extremely happy that the UK Government, Motorsport UK, and the FIA are taking steps to promote the use of electric vehicles, not just in every-day life, but also in motorsport. We are delighted to be one of the first companies to provide a mass-produced electric race vehicle aimed at making electric racing more wide-spread and accessible. The weeks leading up to this announcement have been incredibly exciting for the whole team, and it really feels as though a critical mass has been reached!"

About Barrakuda Racing

Barrakuda Racing is a team based on the Cranfield University Campus, determined to deliver advanced engineering solutions to amateur and weekend drivers and providing an unchallenged level of excitement to motorsport fans across the world.

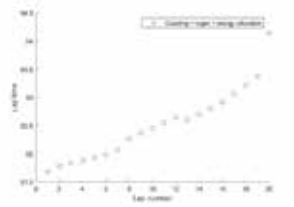
For more information regarding Barrakuda Racing and a detailed Press Kit, please contact Rahul Bhat at 01234 5678, or email media@barrakudaracing.com.

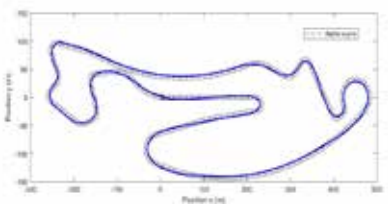
Mission Statement

"An amateur-level, no comprimises electric racecar, aimed at making electric racing more accessible. Lightness is key, using ground breaking cooling technology, and incorporating sustainable and recyclable materials to the design."

BARRAKUDA RACING

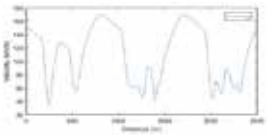
Optimum Control

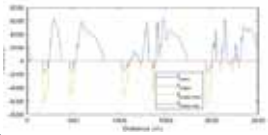




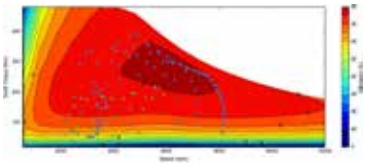
Racing line optimisation.

- Energy management strategy including coasting and regenerative braking: 6.1 s/lap improvement
- Optimised energy allocation for each lap: 2.5 s race time improvement
- Qualy performance (Berlin): 88.5 s
- Race performance (Berlin): 92.5 s/lap average



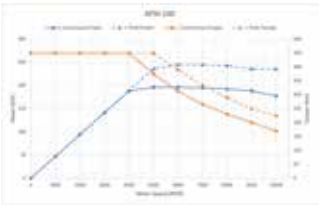


Powertrain



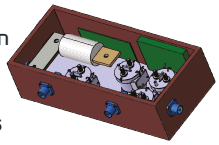
Battery

- 35kWh full battery distributed in 5 identical modules
- 38s12p cells configuration placed in 24x19
- Lithium-Ion chemistry
- Nickel-Manganese-Cobalt cathode
- Energy density: 226Wh/kg



Motor

- Lightweight, high efficiency IPM Motor: APM 200
- Power/Weight Ratio: 4.75kW/kg
- Peak power: 220kW. Continuous power: 198kW
- Peak torque: 450Nm. Continuous torque: 450Nm
- High efficiency: 80% of operation time is ≥94%



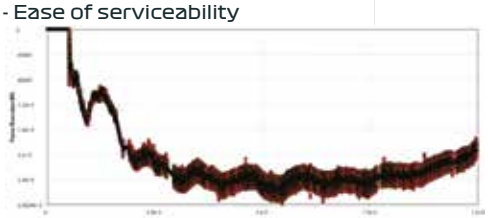
Electronics

- BMS: Distributed architecture
- Busbars: Heat resistance & cost reduction by geometrical & material optimisation
- Switchbox: Fuse and contactor selection & pre-charge circuit design
- Charger: RIMAC OBC 22

Structural

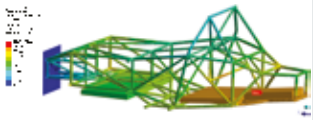
Battery Enclosure

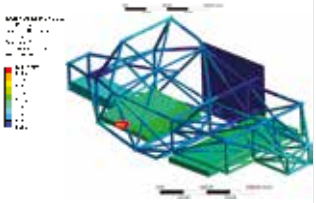
- 100G Test: No internal failure, 1 mm enclosure deflection
- Condensed weight of 55kg
- Ease of serviceability



Chassis

- Welded 7075 space-frame using TiC enabled filler rods, fully recyclable construction
- 550 MPa post-weld treated
- 38 G explicit dynamic test





Barrakuda BR21

220 kW
Party Mode

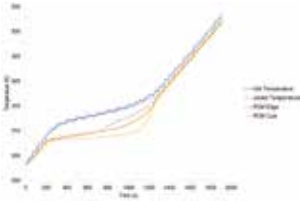
Flax Fibre
Body Work

45:55
Weight Distribution

693 kg

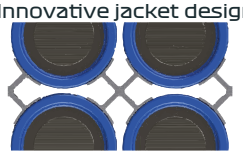
1.5 G
Lateral Acceleration

Cooling

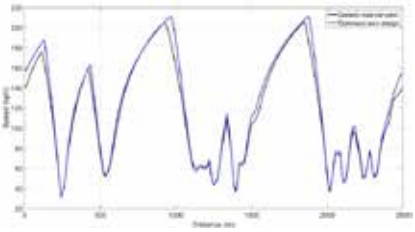


1mm spacing, 30° C initial

- No loss in performance for ambient conditions up to 30° C.
- Total PCM mass <20 kg
- Innovative jacket design

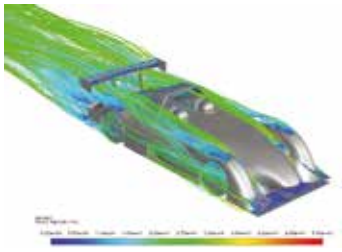


Aerodynamics



At a velocity of 216 km/h

C_LA = -3.04 Lift = -6680 N
C_DA = 0.75 Drag = 1660 N
-L/D = -4.02



- CFD validation against wind tunnel data
- 10% reduction in drag @ 216 km/h
- 3.4s lap time gain compared road vehicle aero

Vehicle Dynamics

- All-weather, road legal 18-inch performance tyres promoting sustainability by extending tyre life and reducing costs
- Suspension geometry modified to accommodate clever energy storage system packaging and aerodynamic requirements

- Pull-rod actuation at the front and push-rod actuation at the rear
- Vehicle setup optimised to reduce tyre load variation using aero-maps and bump profiles on a 7 degree of freedom shaker-rig simulator

MSc Advanced Motorsport Engineering & Mechatronics

- Rahul Bhat
- Kenneth Fernandes
- Samuel Grech
- Borja Hernando Velasco
- Jack King
- Samuel Mifsud
- Julien Repezza
- Jaime Rodríguez Martínez
- Pippa Treacy
- Ben Wiles
- Huining Zhang

Radical · Cranfield Simulation · motorsport UK · Institution of Mechanical Engineers · Racecar engineering · Cranfield Impact Centre

Barrakuda Racing

Rahul Bhat

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Samual Grech

Borja Hernando

Jack King

Samuel Mifsud

Barrakuda Racing

Julien Repezza

Jaime Rodriguez Martinez

Philippa Treacy

Ben Wiles

Huining Zhang

Rahul Bhat

+44 7587039924 rahul.bhat@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

A motorsport engineering professional, passionate about all areas of motorsports strategy and vehicle design. Creative, innovative and capable of taking on a project from concept to completion. Possesses natural leadership qualities and is an effective relationship builder with both team mates and team leaders. Previous academic, extra/ co-curricular activities and work experience has enabled development of outstanding engineering skills and pragmatic yet innovative thinking capabilities. Has proficiency in fluent English communication. Eligible to work in the UK from September 2021 until February 2024 with graduate post-study work visa route.

KEY ACHIEVEMENTS

- Developed a thermodynamic simulation of a 700kW Formula 1 hybrid engine on AVL Boost as a part of 'F1 Design Sprint 2020' at Cranfield University, under guidance of MBE Matthew Harrison
- Established a start-up for supply of international racing products in the Indian motorsports market in 2019 (www.unosworld.com)
- Led as captain of an Indian engineering collegiate SAE Baja team of 35 members, raised and managed budget worth GBP 30000 and achieved a top 10 World rank (6th) at SAE Baja Tennessee, USA competitions 2019
- Directed vehicle-dynamics design team of most dynamic car (rank 1st) at Baja SAE India 2019 and most innovative car (rank 1st) in 2018

EDUCATION

MSc ADVANCED MOTORSPORTS ENGINEERING (1st class expected): Cranfield University, Cranfield, UK (October 2020 - September 2021)

- **Taught Modules**: Composite structures for motorsport, Computational fluid dynamics for motorsport, Motorsport aerodynamics, Motorsport electronics and data acquisition, Motorsport powertrain design, Motorsport structural analysis, Motorsport vehicle dynamics, Business of motorsport
- **Group design project**: Design and development of a concept open-top electric sports car to be used in a feeder series to Formula E
- **Individual project thesis**: Publish detailed thesis project with a distinct motorsport related topic of personal interest or in collaboration with a motorsport company; Topic TBC
- **Extracurricular**: F1design sprint- Development of a thermodynamic simulation of the 1.6L V6 Formula 1 hybrid engine and predicting performance characteristics of the engine

B.E. PETROLEUM ENGINEERING (2:1): MIT, (S.P.P.U.), Pune: University of Pune, Pune, Maharashtra, India (July 2015 - June 2019)

- **Core Modules**: Advanced mathematics, Chemistry, Electrical and electronics engineering, Material Science and Solid Mechanics, Thermodynamics, Equipment design and drawing, Instrumentation and control, Fluid dynamics, Heat transfer, Numerical methods and Geostatistics, Simulation techniques
- **Seminar Presentation**: Artificial lift using Jet Pumps
- **Final Group Project**: Enhanced oil recovery by hydrocarbon gas injection- an experimental analysis of WAG and SAG process
- **Extracurricular**: SAE Baja- Designed, manufactured and raced 4 Baja buggies at national and international level SAE competitions from 2015-2019

CAREER HISTORY

UNOS World: Racing products: Director of Operations: Pune, Maharashtra, India - Director (May 2019 - Present)
UNOS was started in 2019 by 3 colleagues from MIT-Pune as result of experiencing 4 years and multiple events of collegiate competitions and realising lack of advanced racing equipment, experienced consultation and organised logistical solutions to amateur racing teams in India. UNOS World is a managed platform, created for every enthusiast to find and procure high performance racing products and logistical solutions to elevate level of racing and engineering in Indian Motorsport industry.

- Initiated and established tie-ups with 4 racing products providers from the USA and more in pipeline
- Approached multiple teams and supplied products to over 25 racing teams in first year 2019-20
- Counselled engineering solutions to over 20 teams for racing product requirements by analytical approach towards application and environment of use
- Improved all 25 customer team scores by at least 20 % in respective national and international competitions with products and consultation services from UNOS World
- Created anonymous Instagram page 'BAJAWorks' to improve engagement, interaction and to stay updated with over 1000 target customers from across world

AFCO Performance Group: Freelance Technical Sales Representative: India (July 2017 - May 2019)
AFCO Performance Group engineers, manufactures, and distributes premium Shocks, Springs, Brakes, Cooling, Exhaust Products, Gauges, Scales, Specialty Tools, Chassis Setup Equipment, and Quarter Midget Race Cars and Parts through its various brands: AFCO Racing Products, Dynatech Headers, PRO Shocks, DeWitts Radiators, Longacre Racing Products, and UltimateQM.com. AFCO Performance Group continues to build on over 30 years of manufacturing experience with quality performance products, racing engineering innovation, and superior service and support.

- Started as student representative in India to promote AFCO racing shocks in the Indian collegiate Baja competitions
- Converted opportunity into freelance technical sales representation for AFCO to provide technical consultation to interested student racing teams and suggesting necessary equipment specification for best performance while increasing product sales
- Tended to over 15 teams in 2 years while studying engineering and leading team of 35 student members to national and international level SAE competitions
- Carried momentum onto starting own racing products and consultation company with 2 colleagues; UNOS World

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages**: English (CEFR C2 in IELTS Academic), Basic German (appx. A2) in high school certificate, Native languages: Hindi, Marathi and Kannada
- **IT Skills**: Solidworks, Catia V5, AVL Boost, Ansys Workbench (structural and CFD), HyperMesh, Lotus Shark, MSC Adams, MATLAB, Pi toolbox, MoTec, Adobe illustrator, Microsoft Excel, PowerPoint and Word
- **Volunteering**: Speaker and Manager at 'AUTOMATRIX'; a workshop on fundamentals of automotive technology held in MIT- Pune (2018)
- **Extracurriculars**: Competed in SAE Baja competitions from 2015-2019 and developed 4 off-road buggies by using CAD, CAE and manufacturing technologies
- **Innovation**: Pioneered design and implemented double cardan transmission half shaft as suspension camber linkage in SAE Baja project, Designed and manufactured a functioning Continuously Variable Transmission (CVT) and gearbox integrated single piston caliper for off-road Baja buggy
- **Sports**: Awarded best sportsman (MIT-Pune) for success in university Water-polo team at national competitions (2015-18), Played Football for high school team (2013-15), Casual Tri-athlete, Amateur go-kart racer and off-road racing driver for Baja team (2017-2019)
- **Motorsport Interests**: Formula 1, Dakar, WEC, IndyCar, Moto-GP and WRC

Kenneth Fernandes

+44 (0) 75538 58561 k.fernandes@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

A highly motivated and creative individual with keen interest in motorsports and high-performance mobility engineering. Professional experience of nearly two years working in regulated railway engineering design services preceded by an active student life with prominent involvement in group activities, Formula Student and Automotive student chapters. A team-player with experience working in teams of small to medium size in roles as a subordinate as well as a leader. Possesses a composed and rational mind, exhibiting strong skills in communication and decision-making as well as an eagerness to take up challenging tasks. Fluent user of English language with a beginner level German.

KEY ACHIEVEMENTS

- Inventor on Patent (pending) titled “An arrangement for varying valve timing in internal combustion engines” filed by L&T Technology Services.
- Recognised for outstanding dedication and commitment by client and superiors in the railway department at L&T Technology Services, for being a key contributor to help achieve and maintain targets such as 98% drawing accuracy, 95% first-pass yield, quick turnaround time, and 100% on-time delivery of critical tasks.
- Led the Formula Student team Force Ikshvaku to a new level of competition in Formula Bharat, managing a complete vehicle overhaul and rebuild in under 6 months on a budget of circa £4.5k.

EDUCATION

MSc. Advanced Motorsport Mechatronics: Cranfield University, UK (October 2020 – September 2021)

- **Modules:** Business & History of Motorsport, Motorsport Powertrains, Motorsport Electronics & data Acquisition, Motorsport Vehicle Dynamics, Vehicle Control Applications, Mechatronic Modelling for Vehicle Systems, Advanced Control & Optimisation, Embedded Vehicle Control Systems
- **F1 Design Sprint:** Estimated and modelled con-rod deflections, and helped link MATLAB to improve simulation productivity in a group co-curricular activity utilising AVL Boost 1D simulation to design an engine based on Formula 1 regulations, achieving similar performance
- **Group Project (ongoing):** Topic- Design of an electric sportscar for international championship events
- **Individual Thesis:** Topic TBC. A detailed and thorough research project to enhance understanding in a focused area related to motorsports

B.E. Mechanical Engineering, National Institute of Engineering, Mysuru, India (August 2014 – June 2018)

- **Modules:** Engineering Mathematics, Physics, Chemistry, Material Science & Metallurgy, Strength of Materials, Kinematics & Dynamics of Machinery, Mechanical Vibrations, Fluid Mechanics, Thermodynamics, Heat Transfer, Internal Combustion Engines, FEM, CFD, Engineering Drawing, CAD, Engineering Metrology
- **Memberships:** SAE-India, ISHRAE

CAREER HISTORY

L&T Technology Services (LTTS), Bengaluru, India: Engineer (Railways, Mechanical) (October 2018 – September 2020)
Founded in 2012, LTTS is a subsidiary of the renowned Larsen & Toubro Limited. With a force of over 19000 employees and an annual turnover over US$700M, LTTS has grown to be among the global leaders in Engineering and R&D services capable of supporting industries in all disciplines of engineering.

- Redesigned several impacted structures in and around the engine bay and acted as a key link supporting several other design modifications and documentation updates for railway Track Utility Vehicles undergoing an upgrade to Tier 4 Engines.
- Resolved several engineering change requests requiring design correction, enhancement, or new design and documentation of components, assemblies, installations and weldments. Recognised for contributions made to help the team reach and maintain quality targets along with a steady increase in output.
- Carried out standardisation of 3D models and drawings for raw materials as well as other purchased items to obsolete duplicates and ensure easy replacement in 3D assemblies.
- Designed a preliminary prototype to support a proof of concept for road-rail track measurement vehicles validating a certain measuring product's suitability in application.
- Named inventor on patent (pending) "An arrangement for varying valve timing in internal combustion engines" filed by LTTS.
- Won runners-up at LTTS TECHgium 2018 for devising and creating a novel concept and prototype to demonstrate Variable Valve Timing in internal combustion engines.

Force Ikshvaku Racing, The National Institute of Engineering, Mysuru, India: Team Captain (February 2015 – March 2018)
Force Ikshvaku Racing is the Formula Student team from NIE, Mysuru. Formed in 2014, it is the first of its kind from its city. From very humble beginnings, the team has made a name for itself in India through regular participation, displaying consistent improvement in each year.

- Led a team to a new level of competition in Formula Bharat 2018, carefully managing its limited resources to complete a full vehicle overhaul and rebuild in under 6 months on a budget of circa £4.5k.
- Responsible for coordinating several activities, such as recruitment, design, manufacture, purchasing, out-sourcing, finance, marketing and documentation, in a team of 45 members.
- Headed the Vehicle dynamics team and helped develop key areas in a young team. Created MATLAB/Simulink models for lap-time simulation, kinematics & force analysis of suspension components.
- Developed a rudimentary method for tyre characteristic determination with on-board sensors and data - logging to obtain data to be used for basic lap simulation.
- Designed suspension geometry, control arms and uprights by developing and making use of more detailed force analysis methods to reduce excessive factors of safety, contributing to an overall weight reduction of 25% when compared to the previous car.

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages:** Fluent in English, intermediate Hindi and Kannada, beginner in German
- **IT Skills:** Proficient in MS Office suite, MATLAB/Simulink, Python, 3D CAD (Solid Edge, Solidworks, CATIA), AVL Boost, Teamcenter PLM, Arduino; Beginner in Modelica/Dymola, Pi Toolbox, Ansys Workbench, Fluent.
- **Individual Interests:** Motorsport- Fan and follower of a variety of series. Sport- Regular 10k runner, enjoys sport for leisure and as a fan. Hobbyist projects in carpentry and general fabrication. Music and Art- Plays Guitar; Practices realism in sketches and oil painting
- **Volunteering:** Porwal Electric, India: Initial prototype design assessment and fabrication of a three-wheel electric vehicle concept (prior to company's official registration)
- **Professional/Technical training:** MATLAB Programming for Numerical Computation (2020), Introduction to Airplane Performance (2019), Fundamentals of Gas Dynamics (2019), Welding Technology & Design (2019), Basic Course in Automobile Technology on Commercial Vehicles (2015)

Samuel Grech

+44 0774 2752210 s.grech@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

A committed postgraduate engineer passionate about motorsports. Skilled team manager, composite manufacturing and material handling background, as well as competent engineering design skills all reinforced by four years of formula student experience. Experience in building and maintaining sponsor relationships and working on social media outreach. Proficient in English, involvement in public speaking and dedicated to knowledge transfer, combined with engineering expertise.

KEY ACHIEVEMENTS

- Nominated as Engineering Representative, Internal Officer, President, and Vice President for Engineering at University of Malta Racing (Formula Student) 2016 – 2020, and competed in FSAE Italy 2017, FSUK 2018 and FSUK 2019, led the team to develop and present a concept for a Formula Student vehicle
- Carried out an individual thesis on anodising techniques for structural adhesive joints for Formula Student applications
- Competed in the 2012 COJI games in Corsica and the 2015 FISEC games in Malta, representing Malta as a track and field athlete
- Played bass with an indie/rock band (2014-2015), performed cover songs and assisted with original compositions, took part in multiple live gigs in bars and small music festivals

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, Cranfield, UK (October 2020 - Present)

- **Modules:** Motorsports Powertrains, Motorsport Electronics and Data Acquisition, Business of Motorsport, Motorsport Aerodynamics, CFD for Motorsport, Structural Analysis for Motorsport, Composite Structures for Motorsport, Vehicle Dynamics

- **Group Project:** ‘Corona Charge’, development of an open-top, electric sports car based on a Radical RXC which is to be used in a new support race series for Formula E (TBC)

- **Thesis:** Analysis of a rear wing that experiences adhesive failure at the joints, modelling and analysis of the loading, and design improvement (TBC)

B.Eng (Hons) in Mechanical Engineering: University of Malta, Malta (October 2016 - October 2020)

- **Modules:** Mechanics of Materials, Engineering Statics, Fundamentals of Electronics, Maths for Engineers, Metallurgy and Material Science, Thermodynamics, Fluids Mechanics, Advanced Manufacturing, Materials Selection, Manufacturing Systems, Ferrous and Non-Ferrous Materials, Numerical Methods for Engineers, Public Speaking, Sampling and Probability, CAED, Machine Dynamics, Sustainable Engineering, Quality Management and Control, Joining Processes, Surface Engineering, Material Degradation, Mechanics of Material Failure, Biomaterials, Nanotechnology and Nanomaterials , Material Characterisation
- **Thesis:** 'Structural Adhesive Bonding of CRFP Tubing to Metallic Inserts'. The scope of the project was to aid the Formula Student team in considering alternative, light-weight joints for tubular structures (such as suspension links). Phosphoric acid anodising was used as a surface engineering technique for preparing aluminium for adhesive bonding

CAREER HISTORY

University of Malta Racing, Formula Student (2016 – 2020): Malta
Actively engaged in the university’s Formula Student team during the duration of the mechanical engineering undergrad course, taking part in various roles within the team; namely Engineering Representative, Internal Officer, President, and Vice President for Engineering.

2019 – 2020:

- Managed material acquisition, outsourced machining services for part manufacturing, as well as assigning and overseeing engineering tasks within the composites department
- Led chassis manufacturing and general assembly of the whole design package
- Aided younger team members with knowledge transfer in preparation for the 2021 competition with regards to both engineering and business aspects in meeting target goals
- Partnered with team president for sponsorship pitches and interviews focused more on a new electric design
- Experimented with Type III anodising for improved wear resistance and aesthetic appearance of aluminium components

2018 – 2019:

- Managed the general running of the engineering and business teams
- Engaged in creating new sponsorship relations, and maintaining pre-established ones for financial and service support
- Took lead of the team's social media outreach, worked with photography, filmography as well as graphical design

2017 – 2018:

- Focused on member recruitment, work management and deadline enforcement, event organising, social media outreach and photography
- Engaged with the composites team with design of non-structural ergonomic parts, and mould preparation for manufacturing CFRP parts

SKILLS, INTERESTS AND EXTRACURRICULAR ACTIVITIES

- **Languages:** Fluent in English and Maltese
- **IT Skills:** Confident IT user, experience with Autodesk Inventor, Ansys Workbench, Hypermesh, Simplify 3D, AVL Boost, Adobe Illustrator, Adobe Lightroom, DaVinci Resolve, Audacity, CES Edupack, MS Office
- **Individual Interests:** Capable bassist and guitarist, a deep interest in the automotive culture including the aftermarket and modifying scene, as well as the restoration sector, junior go-kart racing experience, sim racing enthusiast, automotive photography
- **Volunteering:** Volunteered as a photographer at multiple automotive gatherings
- **Memberships:** University of Malta Racing Formula Student alumnus mentor/advisor
- **Professional/Technical Training:** Track and Field Athletics (2007 - 2017), Diamond Flight Training Cadet Pilot Course (2011), Music Theory with The Associated Board of the Royal Schools of Music (2005 – 2010)

Borja Hernando

+34 616 658 587 borja.hernando-velasco@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

A detail oriented, mentally agile engineer with three years' experience in Formula Student Bizkaia undertaking roles of Drivetrain Engineer and Electric Powertrain Manager. Worked on cutting edge projects including the design of a compound stage planetary gearbox for an in-wheel motor vehicle architecture. Possesses strong academic background, with great analytical skills, achievements recognized with various awards. Extensive teamwork experience in a fast-paced environment. Gained valuable leadership skills managing a department of 10 engineers. Involvement in personal tutoring of STEM subjects – strong emotional qualities. Achieved outstanding graduate and postgraduate qualifications. Played football in school team – learned importance of cooperation and teamwork.

KEY ACHIEVEMENTS

- 2nd Place in Mathematics Olympiad (Basque Country)
- 5th Place in Physics Olympiad (Basque Country)
- Honors: 1st of class overall in BSc in Industrial Engineering
- 3rd in Design Event Presentation, Formula Student UK 2019. Presented and justified the engineering decisions made and solutions adopted throughout the design process of the electric powertrain.
- Designed and assembled a drivetrain based on two motors with planetary gearbox for a Formula Student electric racecar.
- Led Powertrain department inside Formula Student Bizkaia during the 2018/2019 season. Involved in the design, manufacture, assembly and testing of the whole powertrain system. Managed and supervised a team of 10 engineers to meet the deadlines set at the beginning of the season.
- Driver for 3 years for Formula Student Bizkaia (in addition to the main drivetrain/powertrain engineer role). Gained a deep understanding of the functioning and behavior of an electric racecar.
- Carried out an innovative project focused on the design of a compound stage gearbox for in-wheel motors vehicle architecture.

EDUCATION

MSc in Advanced Motorsport Mechatronics: Cranfield University, Bedford, UK (September 2020 - Present)

- Main modules: Motorsport Electronics and Data Acquisition, Motorsport Vehicle Dynamics, Vehicle Control Applications, Mechatronics Modelling for Vehicle Systems, Advanced Control and Optimization, Embedded Vehicle Control Systems
- Group Project: TBC
- Thesis: TBC

MSc in Industrial Engineering: University of the Basque Country, Bilbao, Spain (September 2019 - Present)

- 8.25/10 overall grade in first year (Spanish Grading System)

BSc in Industrial Engineering: University of the Basque Country, Bilbao, Spain (September 2015 - September 2019)

- Average grade of 9.1/10 (Spanish Grading System) being overall 1st in class (also 1st of class in first 3 years)
- Honors Degree in 17 subjects
- Innovative in wheel gearbox concept development for AWD vehicle as Final Degree Project
- Efficient time management to combine academic study with Formula Student Project

CAREER HISTORY

Formula Student Bizkaia: Bilbao, Spain (2016 - 2019)
Fast paced student organization that designs, manufactures, and assembles a high technology electric racecar with which the team challenges top universities around the world.

Powertrain Manager (September 2018 - September 2019)

- Led a department of 10 engineers. Managed to meet team's deadlines, enabled extensive testing time before competition
- Learned managerial skills, coordination, and cooperation with 6 other department managers and team leader
- Implemented regenerative braking in car after extensive testing; improved efficiency of vehicle by 15 %
- Led manufacturing of a 3 kg battery container manufacturing using aramid fiber
- Transferred accumulated know-how to new team members through extensive documentation and a database in One Drive
- Developed in wheel motor and gearbox concept as a R&D project as a solid basis for future vehicle concept, improvement of vehicle output torque and ability to apply torque vectoring algorithm, reduction of 2 s in lap time
- Conducted visits to manufacturing companies every two weeks to keep track of manufacturing process
- Performed isolated testing of sub-systems of powertrain (included motors, drivetrain, power electronics) before assembly in car, extracted motor torque vs. speed curve
- Coordinated with Quality Engineer to check drivetrain axles for concentricity errors, 0.02 mm concentricity between axle and electric motor

Drivetrain Designer (September 2016 - September 2018)

- Designed a planetary gearbox as main drivetrain element, used two electric motor RWD vehicle concept
- Gained vast experience using following software: Catia V5, Ansys, KISSsoft, Matlab, Simulink
- Led Cost and Manufacturing sub-team of drivetrain assembly. Achieved 2nd place overall in Formula Student UK and 5th place overall in Formula Student Spain. Generated extensive documentation of manufacturing processes of all parts of car
- Performed CAD parts and assemblies' renders using Keyshot, useful for several presentations of team, mainly in competitions
- Conducted drivetrain maintenance every 2 weeks of testing

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages:** native Spanish, fluent English (C1 Cambridge), basic French (A2)
- **IT Skills:** acquired knowledge and practical experience using Catia V5, Ansys Workbench (mechanical), KISSsoft, Matlab, Simulink, AVL Boost, Keyshot, Solidworks, Microsoft Word, Excel, Powerpoint and Outlook.
- **Individual Interests:** Motorsport, nutrition, trail running, healthy habits, spirituality.
- **Analytical skills:** 2nd in Mathematics Olympiad in Basque Country, extensive analysis of car data after testing
- **Volunteering:** been a tutor of 2 high school students and helped achieve A grades with an empathic attitude and easy to understand explanations

Jack King

+44 7564 444617 jack.king@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

A Masters level engineering student with a background in both Aeronautical and Automotive disciplines and significant interests in motorsport, electric mobility, and transportation. Academic focus on motorsport with specific experience of aerodynamic design & analysis and electric vehicle design for racing applications. Additional experience of project management, design engineering, analysis, and simulation with a proven strength in communication within teams and with higher levels of management. Enthused by producing optimum solutions to presented problems; projects are approached in a professional yet flexible manner.

KEY ACHIEVEMENTS

- Achieved a First-Class MEng with Honours in Aeronautical Engineering from City, University of London and received yearly bursaries of £1500 from the university for continued academic success
- Developed a Direct Numerical Simulation computational fluid dynamics solver for 2D turbulent flows in MATLAB using time explicit Adams-Bashforth and Crank-Nicholson discretisation methods.
- Designed Deep Q and Genetic learning powered steady state dynamics vehicle control optimisation tool for motorsport applications using Python and MATLAB languages
- Orchestrated and managed initial development of City, University of London's switch from combustion to electric power for 2021 Formula Student UK competition

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, Cranfield, UK (September 2020 - Present)

- Studies in Computational Fluid Dynamics & Aerodynamics, Motorsport Electronics & Powertrains, Business of Motorsport, and Structural Analysis
- Completed an applied racing vehicle aerodynamics module focusing on ground vehicles and wind tunnel testing techniques. This module included a group project to analyse the effects of several aerodynamic aids (Spliiter, Rear Wing, and Diffuser) on a DrivAer Sportback model in moving ground wind tunnel simulations. The project culminated with optimising the set-up for maximum downforce while maintaining desired aerodynamic balance.
- Undertook a project to design a 4-Cylinder Turbo Charged ICE for a BTCC application. Performance was studied in detail to tune geometric and operational parameters for peak torque at a chosen RPM, making use of commercial software AVL Boost
- Engineered an Arduino based positional actuator and control system, utilizing a model-free Proportional Integral Derivative Controller

MEng (Hons) Aeronautical Engineering (1st Class): City, University of London, London, UK (September 2016 - June 2020)

- Studies in Advanced Computational Fluid Dynamics & Fluid Mechanics, Advanced Aerodynamics, Engineering Electronics, Structural Dynamics & Aeroelasticity, and Systems Engineering
- Formula Student: Leader of EV development team - Key responsibilities included driving project progress by supervising the Chassis, Powertrain, & Suspension sub-groups and working to alleviate operational faults. Additional responsibility for design, analysis, and optimisation of a Hub-Mounted Motor Upright system and reporting progress weekly to academic and university leaders
- Individual Thesis: 3D RANS CFD investigation of a 'forced stall' high lift, 5 element wing (E432 profile) in ground effect. Meshing, simulations, and post processing performed with commercial packages Pointwise, OPENFoam's PISO foam solver, and TecPlot 360. Work was situated in the context of a Formula Student front wing
- Designed and coded an incompressible Newtonian 2D DNS fluid dynamics solver using discretised Navier Stokes equations in explicit time. Discretisation methods included Crank-Nicholson for wall diffusion and Adams-Bashforth for remaining terms. Solver was verified using data for flows in an open channel with bottom surface ribs and showed high correlation
- Conducted wind tunnel operation and data collection training during fluid dynamics courses
- Choreographed project to design and analyse a 580kW gas turbine helicopter engine from first principles through to final specification. In addition to the leadership role, technical responsibilities included turbine specification, cooling, and housing design
- Oversaw upgrade of existing formula student driver training simulation tools, radically enhancing system flexibility and effectiveness. Upgrades shifted the system from an expensive toy to a genuine development tool
- Volunteered as Communications Officer for Aeronautical & Mechanical Engineering Society for 2 years, working to coordinate lectures with external professionals and organise course study groups

CAREER HISTORY

Silverstone Circuit: Silverstone, UK - Customer Service Attended (Summer 2019)
Silverstone Racing Circuit Merchandise Supply and Retail

- Catalogued stock levels using a rolling system during service hours, improving accuracy and efficiency of requests to warehouse for new stock, resulting in a 10% reduction in time taken to restock
- Corresponded daily with general management to improve levels of service provided to customers
- Coordinated a 4-person team setting up temporary shops required for operation during event weekends
- Boosted personal ability to work with customers and understand client requests by working with managers to diagnose and overcome previous weaknesses

Holland Cooper: Moreton-In-Marsh, UK - Warehouse Operations (Summer 2017)
Luxury Clothing Manufacturer and Retailer

- Reduced time taken for 'Pick & Pack' operations by around 30% by analysing order patterns and optimising product locations to reduce walking distance for popular items
- Addressed stock shortages and miss-orders by helping to implement efficient stock tracking tools using commercial software (Warewolf) augmented with self-written Python codes to automate several smaller tasks
- Supervised training of a new member of staff on 'Day-to-Day' systems and processes

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages:** Native English Speaker, beginner level French
- **Proficient with several IT suites:** ANSYS Fluent, AVL Boost, OPENFoam, OptimumLap, ChassisSim, Pointwise, TecPlot 360, SOLIDWORKS, SolidEdge, AutoCAD, Slic3r, Cura, Visual Studio Code, and Microsoft Office
- **Coding:** Experience of working with several higher-level coding languages including MATLAB, Python, and C++ (including experience of control systems using Arduino). Additional experience with API and Python-Web integration (projects include real-time stock trading programs and email automation)
- **Personal interests:** include Motor Racing, Modern History, Architecture (notably early Modernism, Art Deco, 19th Century, and Brutalism), Railway and Vehicle Modelling, and cycling
- **Memberships:** Currently a member of the Royal Aeronautical Society and IMechE

Samuel Mifsud

+4407521492088 Samuel.Mifsud@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

A driven and target oriented postgraduate engineering student pursuing an MSc in Advanced Motorsports Engineering. Competed within Formula Student for four years. Experience is focused on vehicle engineering design, manufacturing, powertrain optimisation and team management. Knowledgeable in 3D printing technology and rapid prototyping thanks to an internship placement scheme. Enthused by the motorsport industry. Project planner and organiser, capable of finding the right communication style that suits the type of individual. Team-driven, good listener and eager to take on new challenges. Capable of approaching complex problems systematically and successfully. Persistent in delivering high standards of professionalism in work with a passion to succeed in the motorsports sector.

KEY ACHIEVEMENTS

- Attained a First Class Honours Degree from the University of Malta in B.Eng. (Hons.) in Mechanical Engineering.
- Enhanced CAD skills and 3D printing knowledge within a short time frame which helped to benefit an innovative packaging project, offered by TOLY Products Ltd.
- Modelled the aerodynamic performance of an aircraft propeller through application of the Blade Element Momentum Theory, using MATLAB.
- Publication of LPG electronic control circuit used in final year project, as a research paper to the Institute of Electrical and Electronics Engineers (IEEE).
- Awarded the 2020 REGISTRO ITALIANO NAVALE (RINA) Student Naval Architect Award for achieving the highest mark and the best maritime related final year project.

EDUCATION

MSc in Advanced Motorsports Engineering: Cranfield University, Cranfield, UK (October 2020 - Present)

- **Modules:** Introduction to Motorsport, Motorsport Structural Analysis, Motorsport Electronics and Data Acquisition, Motorsport Vehicle Dynamics, Motorsport Aerodynamics, Computational Fluid Dynamics for Motorsport, The Business of Motorsport, Composite Structures for Motorsport and Motorsport Powertrains.

B.Eng. (Hons.) in Mechanical Engineering: University of Malta, Malta (October 2016 - September 2020)

- **Modules:** Computational Fluid Dynamics, Mechanics of Materials, Machine Dynamics, Thermodynamics, Heat Transfer, Vibration Analysis, Fluid Mechanics, Compressible Aerodynamics and Propulsion Theory for Aerospace, Finite Element Analysis, Material Science, Computer Aided Engineering Design and Advanced Manufacturing Processes.
- **Individual Thesis:** LPG Dual-Fuel Implementation and Simulation on a Common Rail Diesel Engine.

CAREER HISTORY

University of Malta Racing: Malta - Powertrain Team Leader (October 2016 - September 2020)

A voluntary Formula Student team which designs and builds formula style vehicles to compete with other international students from different Universities. The organisation has competed within FSAE since 2014.

- Managed the powertrain team leader role for three years, being responsible for engine system projects of two formula student type vehicles.
- Planned and coordinated powertrain related projects consisting of: cost quotes, raw material orders, parts and equipment orders as well as lead time required for such projects.
- Led 4 team members within the engine department, making sure members were up to date on assigned projects as well as on overall progress within the team.
- Mentored new recruits on: knowledge of engine systems, operation of manufacturing equipment provided by the team and software utilisation including Autodesk CAD Inventor and Ricardo WAVE Engine simulation. These were carried out through presentations and one-to-one practical hands on sessions.
- Tackled several engineering related projects including: engine map tuning of both a forced induction and naturally aspirated restricted engine, radiator cooling system design, wiring harness installation and CFD analysis along with polycarbonate 3D printing of intake manifold.
- Attained a 10 kg mass reduction within 2020 car engine assembly, having similar power-to-weight ratio of the vehicle built in 2018.

TOLY Products Ltd: Malta - Innovation Intern (July 2018 - September 2018)

TOLY is a privately owned company that caters for the needs of any cosmetic company in the packaging industry. The company offers a vast range of services including the research, design, manufacturing and marketing of packaging products.

- Secured an intern role in the innovation department, being responsible for design and development of a new form of foundation packaging, whilst under the guidance of a Mechanical Engineer.
- Promoted different forms of solutions via prototypes using 3D printing technology. Refined on final design, creating a recyclable prototype, capable of being manufactured through plastic injection moulding.
- Reduced prototype production costs to €1.00 per part thanks to collaboration with the costings department.

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages**: Fluent in English and Maltese, can understand and speak Italian**.**
- **IT skills:** Experienced Microsoft Word, Excel and PowerPoint. Proficient in Autodesk Inventor CAD software and Ricardo WAVE Build Engine Simulation software. Knowledge of ANSYS Workbench: Fluent CFD and FEA as well as MATLAB.
- **Practical skills:** lathe machining, milling, TIG welding, sheet metal fabrication, power tools, 3D printing, engine dynamometer control, ECU tuning and cable harness wiring.
- **Interests:** Motorsports, World War II aircraft and car model construction, fishing, formula one, travelling and discovering new cultures.
- **Volunteering:** Volunteered as a helper with the Paulo Freire Institute (PFI) to teach children (aged 10 to 12 years) with learning difficulties (2016-2018).
- **Extracurricular Activities:** Took part in the F1 Design Sprint project offered by Cranfield University which revolved around the design and simulation of a modern F1 engine on AVL Boost.
- **Memberships:** Member of the Institution of Mechanical Engineers (IMechE).
- **Training:** Pursued a Race Engineering course with the MIA.

Julien Repezza

+33 (0) 660964672 j.repezza@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

Passionate motorsport engineering student, with a strong determination to work in Motorsport industry. Hard worker with ability to deliver results by staying calm under pressure. As a club rugby player, comfortable in a team environment and dedicated to achieving the best outcome. Academic projects have developed coding skills related to simulation as well as discrete, finite, boundary, and volume element methods. Used to race-environment following years as kart racer and eager to improve technical knowledge in industry by taking up new challenges.

KEY ACHIEVEMENTS

- Participated in F1 design sprint: Group project simulating the 2020 F1 powertrain, focusing on elaborating an engine based on tuning and anti-tuning optimisation
- Created a pre-thesis model to investigate particle impacts, in order to set a bench test in a French engineering school.
- Awarded First class with honours during intensive preparation for highly selective entrance exams to French Grandes Ecoles d'Ingénieurs.
- Accepted in major engineering schools: Centrale, Mines-Ponts, Ecole Normale Superieure and ranked 188 out of 5000 candidates on CCP entrance test.

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, Cranfield, UK (October 2020 - September 2021)

- **Modules:** Motorsport Electronics and Data Acquisition, Composite Structures for Motorsport, The Business of Motorsport, Motorsport Aerodynamics, Motorsport Vehicle Dynamics, Motorsport Powertrains, Computational Fluid Dynamics for Motorsport, Motorsport Structural Analysis
- **Group Design Project:** Corona charge: Designing an open-cockpit electric sportscar for international championship events, as a potential support series for Formula-E
- **Individual Thesis:** TBC

ICM - Master's Degree in Science and Executive Engineering: Ecole des Mines de Saint-Etienne, Saint-Etienne, FR (September 2018 - September 2021)

- **Core curriculum**: Mathematics (Operational Research, Signal Processing, Probability and Statistics), Physics (Continuum mechanics and elasticity, Physical properties of solids, Thermodynamics), Computer science (C and Java Programming languages)
- **Elective courses:** Advanced fluid mechanics (Creation of a CFD software based on Lattice Boltzmann Method), Advanced numerical modelling and simulation (Creation of a PDE solver on MATLAB with Finite/Boundary/Volume Element methods, deployed on transfer phenomena and non-linear mechanics), CAD (Inventor), Physical and mechanical modelling by finite elements (ABAQUS code), Eco-design (Eco-responsible and Lightweight systems design)
- **Corporate Finance Modules:** Accounting, Financial management, Mergers, and acquisitions

CAREER HISTORY

Itasca Consultants SAS: Lyon, FR - Internship (June 2020 - August 2020)
Itasca Consultants develops methods and contributes strongly to Research & Development programs for understanding fractured rock environments. These advances contribute to nuclear waste repository safety, and to the design of advanced mining methods. They also help Civil Engineering software clients build Geomechanics models.

- Learned a new coding language (FISH) in two weeks single-handedly
- Modelled a particle impact deploying DEM (Discrete Element Method). Wrote a two thousand lines code, allowing customer to study specific impact mechanics, via six different particle shapes
- Investigated literature of a state-of-the-art subject with less than a dozen relevant publications
- Proposed new particle geometric features, accepted by researchers, helping model to be more realistic, and suggested thirty model parameters suitable for client bench-test design, according to client feedback
- Implemented a Python launcher to automatise impact tests, allowing to study trends resulting from a parameter change via postprocessing script
- Proved to be a reliable and autonomous individual in a context of pandemic, via 100% remote-working, thus one meeting per week was sufficient to assess progress

CPGE: Clermont-Ferrand, FR - Supervised Self-Initiative Projects (September 2017 - June 2018)
CPGE is two years of undergraduate studies in mathematics, physics, and chemistry. Completed multiple projects as part of Intensive preparation for highly selective entrance exams to French Grandes Ecoles d'Ingénieurs.

- Modelled a motorcycle in order to study both gyroscopic effect and stability for engineering school entrance exams presentation
- Chose sensors relevant for testing and in accordance with a low budget, namely an accelerometer, a strain gauge, beam scales and two video acquisition systems, recording specific model parameters
- Designed four different tests, easily repeatable by a rider in a safe environment, allowing the ride to gather all relevant geometric and inertial data
- Conducted tests using a motorcycle instructor on a closed track during three hours, building a strong dataset via repeated tests at different speeds
- Analysed data and found a flaw with the tire modelling. Contacted a former Michelin motorcycle test rider for advice on a solution, he recommended Pacejka's model

Kart quad sensations: Bourg-Lastic, FR - Volunteer (March 2011 - March 2011)
Kart quad sensations is a go-kart track family business.

- Changed carburettors of a twenty-go-kart fleet, as a switch to ethanol fuel, and provided support as a mechanic
- Managed clients on-track safety, and acted as a driving instructor

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages:** French (native), English (professional working proficiency)
- **Technical:** MATLAB, Python, Finite Element Analysis (ABAQUS, Hypermesh), Computer-Aided Design (Autodesk Inventor), CFD (Ansys CFX), Excel VBA, AVL Boost, Microsoft Office Suite
- **Sport:** Played Rugby in club and University Club Team for 4 years in total. Boxing for two years. Skied for years, and in club. Regular gym goer, swimmer, and racing cyclist
- **Music:** Saxophonist for 7 years, played in harmony orchestra and jazz band
- **Racing:** Active sim racer and regular go-kart endurance race driver as part of a go-kart non-profit organization
- **Volunteering:** Youth leader for two years, in a structure involving logistics and supervising outside activities for groups of forty children

Jaime Rodríguez Martínez

(+34) 620 721 629 j.rodriguez-martinez@cranfield.ac.uk
Cranfield University | Madrid's Polytechnical University

PERSONAL STATEMENT

A resilient, target-orientated, and problem solver double master's student reinforced by academic and international experience within the industrial engineering field. Possesses strong communication and organisational abilities due to extensive exposure of studying a demanding bachelors and working under pressure in positions of responsibility in diverse environments. Fluent in English developed throughout academic and work experiences, including successful internship. Established outstanding teamwork skills through the implementation of challenging engineering projects. Enthused by automotive and mechanical engineering and the world of motorsport. Always striving for perfection and looking for a first job opportunity to grow personally and professionally and enhance technical skills further.

KEY ACHIEVEMENTS

- Ranked within the top 20% of Industrial Engineering Bachelors at Madrid's Polytechnical University, considered the best in Spain. Passed all courses within the minimum required time, only achieved by 25% of the university's graduates
- Designed and manufactured a processing chamber and temperature control system for a new creative method of carbon nanocomposite synthesis. Resulted in raising the fracture energy of epoxy resins by 4% utilizing purely mechanical processes
- Created and built a detachable Curtis turbine implementing an innovator manufacturing method by casting for the rotor and comparing the importance of kinetic energy losses versus ventilation losses
- Achieved fourth place out of 150 candidates in the 2018 national edition of European BEST Engineering Competition (EBEC) organized by the Board of European Students of Technology (BEST)

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, Cranfield, United Kingdom (September 2020 - September 2021)

- **Modules**: Motorsport Powertrain Design, Motorsport Electronics and Data Acquisition, The Business of Motorsport, Motorsport Aerodynamics, Computational Fluid Dynamics (CFD) for Motorsport, Motorsport Structural Analysis, Motorsport Vehicle Dynamics, Composites Structures for Motorsport.
- **Group Design Project**: Design of an electric sportscar for international championship events as potential support series to Formula-E

Master's degree in Industrial Engineering (8.12/10): Universidad Politécnica de Madrid, Madrid, Spain (September 2019 - September 2021)

- The Master's program extends the bachelor's syllabus with courses such as Supply Chain Management, Thermal Engines, Renewable Energies, Control Theory, Control Systems, Transport Engineering and Chemical Processes
- **Group Design Project (8.9/10)**: Created and built a detachable Curtis turbine with a 5 engineer's team using CATIA and MATLAB software's. Head of the material's purchasing, CAD design, and turbine's marketing campaign, and collaborated in the report elaboration using Microsoft Office (Word, Excel, Power Point, and Project)

Bachelor's in Industrial Technologies Engineering, specialised in Mechanical Engineering (7.2/10): Universidad Politécnica de Madrid, Madrid, Spain (September 2015 - September 2019)

- **Relevant Modules**: Calculus, Algebra, Physics, Thermodynamics, Materials Science, The corporation and its Environment, Productive Systems Organisation, Engineering Graphics, Fluid Mechanics, Strength of Materials, Heat Transfer, Theory of Machines and Mechanisms, Automation, Automobiles, Regression Models and Machines Design
- **Individual Thesis (9.2/10)**: Design (using CATIA V5) and manufacture of a processing chamber and temperature control system for a new method of carbon nanocomposite synthesis. In collaboration with the Machines Engineer Department of Madrid's Polytechnical University

CAREER HISTORY

Eli Lilly: Kinsale, Cork - Internship (July 2018 - July 2018)

Lilly is a multinational pharmaceutical company responsible for manufacture medicines for oncology, cardiovascular, diabetes, critical care, neuroscience, men's health, osteoporosis, and psoriasis. Lilly Kinsale, in Ireland, is the main centre for the manufacture and supply of active ingredients for its new biopharmaceutical medicines.

- Gained knowledge about chemical industry by studying the manufacture of active principles for 6 chemical products deploying biotechnology and chemical engineering
- Developed teamwork abilities participating in meetings, supervised by a senior engineer

Mater Salvatoris School: Ireland - Summer Camp Leader (July 2014 - July 2017)

Mater Salvatoris is a private and catholic school in Madrid that organises one-month English courses in Ireland for more than 60 years.

- Cooperated with 15 other leaders in the organisation of the summer camp attended by 150 to 200 Spanish students
- Headed orientation sessions during 2 years with academic mentors to ensure students English and personal development
- Led and guided 4 groups of 15 to 20 Spanish students between 10 and 16 years old
- Carried out and managed logistics (including purchase of academic material) for +60 educational activities for students such as games, excursions, gymkhanas among others

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages**: Native Spanish speaker with fluent English. French A2 accreditation, and German A1 course
- **IT Skills**: Experienced in MATLAB/Simulink, CATIA V5, AVL Boost, Microsoft Office. Basic in C and python programming, NX, Ansys Fluent, Hypermesh, and Solid Edge
- **Sports**: Captain basketball player in Maravillas high school for 10 years (2005-2015) in Madrid's regional league. Champion in third division (2012) and third place in first division (2013). Football player in internal university league for 3 years (2015-2018)
- **Individual Interests**: Passionate about the understanding of human behaviour, particularly in psychology and emotional intelligence; Basketball, Formula One, and automotive and mechanical engineering lover; travelled to 15 countries across Europe and America inspired by exploring different cultures
- **Organisations**: Associate member of the Institution of Mechanical Engineers (AMIMechE) and junior member of ASEPA (Spanish association of Automotive Professionals).
- **Volunteering**: Scrutineer Car Trainee for Motorsport UK (Licence No. 372147). Organised 4 week-end spiritual retreats for 70 young people between 18 and 28 years old together with 70 leaders and provided spiritual and psychological counselling through active listening and empathy
- **Professional/Technical training**: Finite Element Analysis course using CATIA and NX (90 hours), Emotional Intelligence Course (25 hours), How to Speak in Public Workshop (10 hours), Python Basics course (6 hours), Improving Listening Skills Course (2 hours), Word 2016: Formatting and styles in depth course (6 hours), Word 2016: Building Long Documents course (6 hours), Word 2019: Essential Training course (4 hours)
- **International Experience**: Completed 6 English courses in Ireland during one month hosted by different Irish families (2007-2013)

Philippa Treacy

0 7917 698708 pippa.treacy@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

Mechanical Engineering Graduate currently completing an MSc in Advanced Motorsport Engineering at Cranfield University. Prior practical automotive experience at Grace Harvey Garage as a junior mechanic. Exhibits strong leadership, organisational and analytical skills demonstrated through positions held both academically in group design projects and professionally by being a founding member of Formula Female and being a part of the resurgence of Formula Woman. Focused on data analytics and aerodynamics, evidenced through trackside experience with three race teams - Valluga Racing, Formula Woman and Formula Ford - and conducting a research project on the 'Numerical and Experimental Study of Flow Characteristics around a NACA0012 airfoil with Variations of Aspect Ratio and Angle of Attack'.

KEY ACHIEVEMENTS

- Development of a small E-Commerce pub equipment and antique sales business. Generation of €8000 in revenue.
- Achievement of an A grade in final research project on 'Numerical and Experimental Study of Flow Characteristics around Wing Airfoil NACA0012 with Variations of Aspect Ratio and Angle of Attack'.
- Founding member of 'Formula Female' – an initiative to encourage younger women into STEM based subjects
- Finished top 10% in the Leaving Certificate in Ireland.

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, Cranfield, UK (October 2020 – Present)

- **Modules:** Electronics and Data Acquisition, Computational Fluid Dynamics for Motorsport, Motorsport Aerodynamics, Motorsport Powertrain Design, Motorsport Vehicle Dynamics, The Business of Motorsport, Composite Structures for Motorsport
- **Group Project:** Design of Electric Sportscar for International Championship Events
- **Thesis:** Employment of Computer Vision and Machine Learning Techniques as a Non-Contact Sensor for Vibrational Analysis of a Front Wing of a Motorsport Vehicle.

BSc Mechanical Engineering (GPA 3.64): University College Dublin, Dublin, Ireland (September 2016 – June 2020)

- Multivariable Calculus II (A), Mechanics of Fluids (B+), Process Control (A-), Modelling and Simulation (B), Applied Dynamics II (A+). Electrical Energy Systems (A+), Material Science and Engineering (A+), Statistics and Probability (A)

CAREER HISTORY

Formula Ford – Intern Data Engineer (March 2020 – Present)

- Assist with set-up changes over race weekends for optimization of mechanical grip at various race tracks.
- Troubleshooting of software issues and update of systems when required.
- Analysis of data from race sessions and coaching of five drivers each weekend at various UK circuits
- Configure and acquire data from five cars each weekend.

Formula Woman - Intern Data Engineer (December 2020 – Present)

- Analysis of data from various sessions during track days with amateur drivers. Experience on both wet and dry tracks.
- Cleaning and washing Jaguar F-Type GT4.
- Acquire data from Vbox module and ensuring system is working.

Valluga Racing - Intern Data Engineer (October 2020 – November 2020)

- Attended two race weekend for Britcar endurance at the Silverstone and Snetterton circuit.
- Analysed data from practise sessions, qualifying and race sessions by working with an ex-LMP2 driver and an amateur driver.
- Cleaning and washing Porsche GT4's to ensure sponsor names were clearly visible.

Catering-Pub Equipment and Antique Dealer (May 2020 – Present)

- Spotted an opportunity in the current climate to capitalise on buying and selling catering and pub equipment from closures of small local businesses.
- Drove sales of beer coolers and add-ons, selling for €800. These sales were fuelled by people setting up beer gardens due to lockdown.
- Upskilled in small scale e-commerce to sell antique goods online and across Ireland.
- Improved sale skills by having rounded product knowledge and handling customer complaints adequately.

Formula Female - Founding Member (September 2019 – Present)

- Developed an initiative encouraging younger girls into STEM based subjects, through application based exercises. Led various sessions on tyre temperature and pressure analysis on-track, data acquisition through use of Arduino boards, racing line mathematics, among other technical exercises.
- Delivered opening speeches to forty schools girls per outing all around Ireland between ages of thirteen to eighteen.
- Endorsing an initiative that closes the gender gap in motorsport by creating more opportunities for females to succeed in male dominated positions on and off the track.

Grace Harvey Garage Ltd - Trainee Mechanic (January 2019 – March 2019)

- Assisted with maintenance repairs on vehicles. Employing use of wheel guns to remove the tyres and replacing brake rotors and pads when required.
- Employed manual processes and computerised diagnostic tools to identify mechanical malfunctions.
- Organising workshop area and cleaning garage for up-keep.

ACADEMIC PROJECTS

Numerical and Experimental Study of Flow Characteristics around Wing Airfoil NACA0012 with Variations of Aspect Ratio and Angle of Attack

- Investigated the flow characteristics of a single element NACA0012 2D airfoil across two software's ANSYS and SimScale. Utilisation of two turbulence models: k-epsilon model and k-omega SST model. Validation against experimental data obtained through low-speed wind tunnel work for the specific airfoil.
- Simulation of a NACA0012 3D airfoil of aspect ratio one, five and infinity in SimScale. Surface pressure distributions and aerodynamic efficiency compared across models. An additional wing tip device was utilised.

MATLAB SOLO Project 2

- Creation of a 10 bar linkage based on a 1991 Ford Mustang. Deconstructed into 4 linkages and represented mathematically as closure equations.
- Solution of unknown positions are resolved and corrected using the iterative solver of Newton-Raphson.
- Simulation and visualisation of 10 bar linkage produced.

Simulation of Various Engine Models with employment of AVL Boost

- Three competition gasoline engines were designed in AVL boost: a single cylinder model, a 2-litre naturally aspirated Honda K20A VTEC type model and a 2-litre turbocharged BTCC type model.
- Benchmarked data was utilised and extrapolated to create powertrain models.
- Varied performance indicators are utilised to demonstrate overall optimisation and performance of the engine.

Vehicle Dynamics Modelling and Simulation

- Creation of a discrete one degree of freedom spring-damper system. Mathematical model resolved and numerically solved in MATLAB. Animation of model and complimented with a graph of displacement and velocity.
- Development of a multiple degree of freedom spring-mass damper set up, mathematically modelled and solved within MATLAB.

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Motorsport** | F1, British F4, Britcar, Formula Ford, W-series, Formula Woman, GT Cup
- **IT Skills** | MATLAB, AVL Boost, ANSYS Fluent, Racelogic, Microsoft Word, Vbox, Python
- **Sport** | Tag Rugby UCD Team (2016 – 2020), Junior A's Hockey Captain, UCD Ladies Hockey Club, Wesley College Athletics, Senior Cricket Team.
- **Languages |** B2 Spanish Level, Irish, English
- **Outdoors |** Hiked the Lost City Trek over four days in Colombia, Salkantay 5 day trek
- **Volunteer Events** | Raised €2000 for Our Ladys Hospice by running 100 miles, Google Design Sprints, Web Summit 2017

Ben Wiles

+44 (0) 7786 132996 ben.wiles@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

Currently studying MSc Advanced Motorsport Engineering at Cranfield University, alongside working for Power Maxed Racing BTCC Team as a trackside data engineer. Graduated with a First Class BEng (Hons) Aerospace Technology degree, completed with a year in industry with Arup. Determined to deliver the highest standards with a passion to succeed. Reinforced through multiple work experience internships and most recently, a year-long industrial placement with Mercedes-AMG Petronas Formula One Team. A driven, enthusiastic individual who possesses key skills in communication and team work to support and add significant value to a team.

KEY ACHIEVEMENTS

- Taking own initiative creating new and developing existing data traces whilst working as a trackside data engineer with the Power Maxed Racing BTCC Team; helping to achieve multiple podiums and a race win during the 2019 season
- Participated in a 2020 young driver test with Mercedes-AMG Petronas Formula One Team, expanding knowledge base and partaking in various activities around the garage with team mechanics and engineers
- Competed in Formula Student UK through Coventry Universities' Formula Student Team from 2017 - 2018, placing 14th best overall and 8th best UK team

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, Cranfield (September 2020 – Present)

Group Design Project: *'Conceptual Design of an Electric Sportscar for Formula E Support Events.'* The design of an electric sports car for international championship events based on the open cockpit Radical RXC Spyder.

First Class BEng (Hons) Aerospace Technology: Coventry University, Coventry (September 2015 – May 2019)

- **3D CAD System Modelling:** Experience creating CAD models and technical drawings in CATIA V5
- **Design for Machining:** Experience designing parts for machining through Formula Student
- **Simulation Experience:** Competent in Star-CCM+ for Computational Fluid Dynamics (CFD) simulations
- **Presentation of Key Findings:** Presented key findings of various projects both in a verbal manner and through concise written communication
- **Adaptability and Time Management:** Amended project plans to suit changing circumstances, while managing different modules' deadlines to ensure timely submission of all work
- **Communication and Leadership:** Managed teams during university projects thus honing effective communication skills and leadership styles dependent on individual teams

Group Design Project: *'Aerodynamic Design and Optimisation of an Aircraft.'* Worked within a team to design and optimise an existing aircraft using CATIA V5, producing a model to compare a new design with the existing design validated through wind tunnel testing.

Individual Thesis: *'The Design Exploration of the Aerodynamic Package for the Phoenix Racing Formula Student Car using Computational Fluid Dynamics.'* The project focussed on improving the current CFD model used by Coventry University Formula Student team and increased the overall downforce of the car.

Formula Student: A key member of Coventry Universities' Phoenix Racing Formula Student Team for 2017 and 2018 FSUK competitions; placing 14th best overall and 8th best UK team in 2018.

- **Design:** Designed a fuel rail using CATIA V5, producing technical drawings to BS8888 standards
- **Teamwork & Deadlines:** Worked on motorsport chassis' helping to build both 2017 and 2018 FSUK cars
- **Event Coordination:** Set-up of Formula Student car before events, including wheel alignment and ride height for 2018 FSUK competition

CAREER HISTORY

Trackside Data Engineer: Power Maxed Racing British Touring Car Team (March 2019 – Present)

- Analysed data to improve driver performance and monitor car health using Pi Toolbox on all race weekends and test days
- Identified areas where a drivers' driving style and/or car setup can be changed to enhance performance
- Created new and developed existing data traces to improve the overall understanding of car and driver performance
- Established a good working relationship through effective communication with race engineers, drivers and other team members to improve on-track performance
- Managed time effectively in a high-pressure environment to ensure deadlines were met in a timely manner

Mercedes-AMG Petronas Formula One Team, Brackley (2016 – 2020)

Mechanical Design Engineer Industrial Placement (September 2019 – August 2020)

- Responsible for the design and development of a wide range of mechanical components and assemblies in CATIA 3D Experience for projects in the wind tunnel, dyno, simulator and for external companies
- Completed FEA simulations based on a preliminary design for sign off before going to manufacturing
- Created numerous technical drawings for a variety of components and assemblies to BS8888 standards
- Conducted multiple projects throughout the year, continually re-prioritising projects dependent on business needs and requirements
- Engaged in young driver testing, supporting both mechanics and engineers from within the garage to maintain the smooth operation of the car
- Supported trackside engineering during race weekends using tool developed by Mercedes-AMG Petronas Formula One Team
- A dedicated individual shown throughout time with the Mercedes-AMG Petronas Formula One Team returning on multiple occasions

Test and Development Work Experience Internships (8 weeks between September 2016 – September 2019)

- Performed powertrain auxiliary characterisations developing data analysis skills through data review in ATLAS
- Completed various load displacement and safety structure tests, in accordance with FIA testing procedures
- Tested the loading characteristics of suspension components, ensuring they comply with the required standards

Mechanical Industrial Trainee: Arup, Solihull (September 2017 – August 2018)

- Used JavaScript to write scripts for Oasys PRIMER so a crash test dummy model is able to grip a steering wheel helping to improve crash simulation accuracy
- Used Python to write scripts to help speed up common processes and eliminate errors
- Produced clear and concise reports based on simulations carried out in LS-DYNA
- Executed modal analyses and non-linear impact simulations in LS-DYNA to evaluate how new components would respond with the rest of the structure
- Helped to create and develop a new website, liaising with external companies to ensure website requirements were being met

SKILLS, INTERESTS AND EXTRACURRICULAR ACTIVITIES

- **Technical:** Confident user of CATIA (V5 and 3D Experience), Pi Toolbox, Star CCM+, Ansys, Microsoft Office Suite (Word, Excel and PowerPoint), MATLAB and SOLIDWORKS
- **Leadership:** Non-Commissioned Officer in the Army Cadet Force leading a team of cadets on training and at public events
- **Duke of Edinburgh Award:** Achieved Silver Award
- **Motorsport Racing:** Driving experiences at Brands Hatch and Silverstone has improved understanding of single-seater racing cars and what is required to drive them
- **Goodwood Festival of Speed:** Steward at 2016 Goodwood Festival of Speed
- **Motorsport Development:** Technical details of motorsport vehicles through subscriptions to Racecar Engineering Magazine
- **Driving Licence:** Access to own car

Huining Zhang

+44 7521 193344 huining.zhang@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

A passionate motorsport engineer with interests in motorsport and car manufacturing industries. Extensive experiences in structure analysis, MATALB coding and structural optimization during academic projects and previous experience as an engineering intern. Previous bachelor's in Aerospace Engineering developed strong skillset in aerodynamics and internal combustion engine knowledge which can also applied in the motorsport environment. Fluent English and native Mandarin speaker. Strong ability in problem-solving, time management, effective communication, and ability to work with people from different background developed during academic activities and 5 years studying abroad.

KEY ACHIEVEMENTS

- Successfully designed the new composite structure and improved the thermal leakage issue in the industrial R&D project with MaxiTRANS Australia.
- Participated in activities held by Monash Mechanical and Aerospace club including introductory flights and glide flight.

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, Cranfield, UK (October 2020 - September 2021)

- **Modules:** Motorsport powertrain design, Motorsport Electronics and Data Acquisition, The Business of Motorsport, Motorsport Aerodynamics, Computational Fluid Dynamics for Motorsport, Motorsport Structural Analysis, composite Structures for Motorsport, Motorsport Vehicle Dynamics
- **Group Design Project:** Topic TBC
- **Individual Thesis:** Topic TBC

Bachelor of Aerospace Engineering: Monash University, Melbourne, Australia (February 2016 - December 2019)

- Second Class Honours Division A
- **Modules:** Aerodynamics, Aircraft structure, Aircraft engines (internal combustion engine and gas turbine), Composites structure, Aerospace control, Damage Tolerance And Airworthiness, Flight Vehicle Design, Flight Vehicle Dynamics, Aerospace Computational Mechanics, Flight Vehicle Propulsion, Thermodynamics And Heat Transfer, Aircraft Performance
- **Final Year Project:** MaxiTRANS Trailer Project - Refrigerated Trailer Front Wall design

CAREER HISTORY

Monash University/ MaxiTRANS: Melbourne, Australia – Final Year Project (March 2019 - November 2019)
MaxiTRANS is an Australian truck trailer manufacture. They found there was a thermal leakage issue in the current front wall design. This project was to design a composite front wall structure to solve the thermal leakage issue.

- Analysed the current front wall design, found the main structure will fail under the maximum forces defined by the Load Restraint Guide (2018). Presented findings to managers and confirmed by the company's engineer
- Designed 5 different structures under different loading conditions, all the new designs had achieved at least 50% weight reduction and significantly improved the thermal conductivity, successfully reducing the thermal leakage in the front wall area
- Effectively communicated with academic and industrial supervisors during the project to ensure all requirements were met and all parties were informed of progress
- Completed the project on time. Both supervisors and company's managers were satisfied with overall performance and achieved Distinction mark
- Calculated the important aerodynamic coefficients and used the OpenVSP to find the tail rigging angle under specific requirement and achieved 9/10 mark
- Responsible for the landing gear design and centre of gravity calculation, collaborated with other components' designers to make the aircraft stable in extreme conditions
- Worked with teammates from different backgrounds, communicating effectively to contribute to outcomes for the team. Received appreciation during the final team reflection

Monash University: Melbourne, Australia – Academic Activity (August 2019 - September 2019)
Using evolutionary structural optimization (ESO) technic to increase LAU-7 missile launcher housing fatigue life. This is one of the activities in computational fracture mechanics. FEMAP and Autodesk NASTRAN were used to perform the ESO technic.

- Developed familiarity with the ESO technicque, FEMAP and Autodesk NASTRAN, confident to apply this technique to other metallic components.
- Reduced the maximum principle stress by 13%. Increased the missile launcher housing's fatigue life by 64%. Achieved 13.5/15 mark.

Monash University: Melbourne, Australia – Academic Activity (April 2019 - June 2019)
Initial Gas turbine layout design. A new turbofan engine was designed based on the existing pure jet engine PW306C.

- Programmed MATLAB code to calculate the gas properties at different stages and blade angles and used to check the critical parameters are in the right range
- Experienced the engine design and had a deep understood about the fundamental engine design process.
- Improved the fuel consumption by 11.6%.compared to the PW306C. Achieved distinction mark.

Nanjing Kaima Machinery Co., Ltd, Nanjing, China - Engineering Intern (November 2018 - January 2019)
Kaima is a local company with the ability to build pressurized vessels. Small company with around 10 employees, allowing the opportunity to fully understand the manufacturing processes.

- Assisted engineers' work
- Transferred blueprint to electronic version (CAD)
- Entered the manufacturing department to view and learn from the riveter and welder
- Understood about the manufacturing process of the pressure vessels
- Helped engineers to prepare the office documentations

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Technical Skills:** MATLAB, SolidWorks, ANASYS Fluent, HyperMesh, Abaqus, FEMAP, Autodesk NASTRAN, OpenVSP, Microsoft office
- **Languages**: Fluent English, Native Mandarin
- **Extracurricular Activities**: Watched Australian GP Qualifying session live at albert park(2016, 2018), Introductory flights, Glider experiences
- **Interests**: Motorsport – regularly watch F1/WEC races, Sim racing(RFactor2, Assetto Corsa), Aviation, Table tennis, Travel (New Zealand south island is my favorite place)

Media Information

30.04.2021

Cranfield, United Kingdom

E MOTIVE RACING

FOR IMMEDIATE RELEASE

E-Motive Racing is proud to announce it will be the sole manufacturer for an all-new international electric racing series, Corona Charge. Due to the resounding success of electric racing, an opening in the market has led to an exclusive deal to start a support series to Formula E. This exciting new series is due to hit the track late 2022.

The global drive toward electric vehicles forces the world of motorsport to adapt. This series aims to provide the platform needed to accelerate this transformation. Races will last 30 minutes plus one lap and will see a competitive field of bespoke electric race cars fight to be first over the line around the most challenging Formula E circuits around the globe.

E-Motive Racing vehicles will be powered by six battery modules, providing a total of 57 kWh capacity. The cells will be surrounded by a high-tech coolant based on an electrically non-conductive liquid, ensuring that all cells are always in a consistent, optimal working temperature window. Designed with strict safety standards in mind, these modules will be available to other series after season 1. “There is a gap in the market for standardized modules that can power both amateur and professional racing series around the world. Our solution will provide a cost-effective way for the motorsport community to embrace electric powertrain technology”, explained Jamie Hilton, E-Motive Racing CBO.

Two motors on the rear and one on the front will be able to produce a peak torque of 690 Nm. Two power deployment strategies will be available, including qualifying mode producing up to 256 kW to ensure drivers extract maximum performance for the best possible race start. With a weight of 1010 kg, the vehicle will reach a top speed of 260 km/h and will accelerate from 0 to 100 km/h in only 2.8 seconds.

The chassis has been designed with sustainability in mind. Using high-recyclability and lightweight materials, the safety of the driver and passenger will be ensured during the intense racing. The streamlined shape of the car allows for highly favourable aerodynamic efficiency. In addition, the adjustable front and rear wings permit a wide set-up variety, which renders the car adaptable to any circuit and driving style.

E-Motive Racing has developed specialised technology that delivers high performance race vehicles at accessible prices, ensuring drivers can experience electric racing at its finest.

E-Motive Racing Information: www.emotive-racing.com

Headquarters

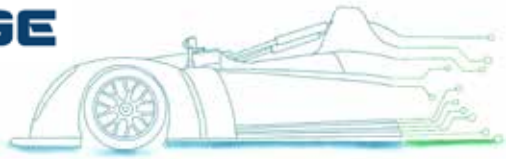
Cranfield, MK43 0AL, Bedfordshire, United Kingdom

Head of Communications

Enrique Gomez
T: +44 7459 706611
enrique-gomez@emotiveracing.com

CORONA CHARGE

MSc Advanced Motorsport Engineering
MSc Advanced Motorsport Mechatronics
Group Design Project
May 2021



E MOTIVE RACING

Introduction

E-Motive Racing has designed and developed the latest electric racing vehicle due to race exclusively in the Corona Charge, a feeder series to Formula E. Corona Charge aims to bridge the gap between grassroots racing and the pinnacle of electric racing. E-motive Racing set out to develop an electric drive train, chassis, cooling and suspension system. An advanced approach to aerodynamic design ensures higher efficiency and a more efficient cooling system. Vehicle dynamic simulations combined all these aspects to deliver the most stable and competitive vehicle.

Objectives

- Design and develop an electric powertrain with performance characteristic similar to the carbon fuelled equivalent
- Design a cooling system that ensures the batteries remain within optimal working range throughout the race duration
- Design and develop a chassis to sufficiently resist loads and maintain FIA standards
- Create aerodynamic bodywork to maximise downforce and provide sufficient cooling, whilst ensuring the car is attractive
- Optimise the suspension and drive train using a custom built lap time simulation

Chassis

Platform-based design. Enhanced modularity

Composite-made chassis. High-recyclability, lightweight materials

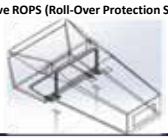
- Carbon fibres:
  - Weave: Toray T800 6K
  - Unidirectional: Torayca Prepreg P17043G-10 (Resin #2574, carbon fibres T1100)
- Honeycomb: Hexcel HexWeb CR III 502 Hexagonal
- Steel for roll hoops: AISI 4815H

Optimised composite laminate

- High-resistance to static and dynamic loads
- Enhanced driver safety
- Weight: **100.4 kg**

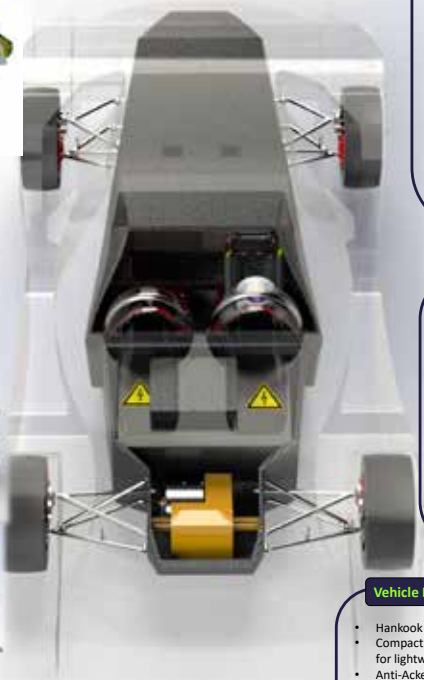
GT-driving position

Innovative ROPS (Roll-Over Protection System)



Overview

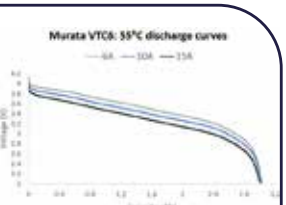
- Total Weight 1025 kg
- Top speed of 260 km/h
- Maximum lateral acceleration: 1.5g
- 30 minute + 1 lap race range



Battery Design & Safety

High performance lithium-ion cells

- Murata VTC6 18650 cells
- 241 Wh/kg specific energy
- High temperature performance tested at Cranfield University
  - Constant discharge & charge characteristics validated
  - Equivalent circuit parameters identified via pulse testing



Modular battery design

- 6 identical modules (3S 2P); 57 kWh capacity in total
- 846 cells (47S 18P) per module
- 197 V per module at start of discharge
- 132 Wh/kg energy density of the assembled module

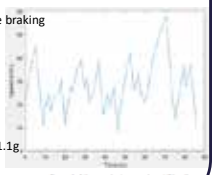
Designed for safety

- Carbon fibre aluminium honeycomb casing
- Two-stage pressure venting with PTFE membranes
- 100g nominal crush tested via FEA simulation; no damage to cells

Power Delivery

Motor configuration

- 3 Axial Flux motors (Emrax 228) : twin on rear axle, single on front axle
- 256 kW for qualifying
- Ability to work as generator for regenerative braking
- Combined Cooling
- 594 Nm of Peak Torque
- Controlled by Unitek Bamocar 700 200/400
- Up to 592 V and 180 A



Gearbox

- 3 Gears Gearbox
- First gear to reach an initial acceleration of 1.1g
- Last gear to reach a top speed of 260 km/h

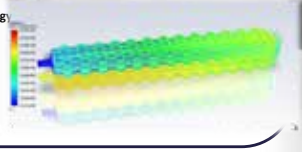
Thermal Management

Immersion Cooled Submodule
Using 3M 7300 dielectric fluid

- Enhanced Safety (Dielectric fluid
- Good heat dissipation capacity
- Smaller CFD scale
- Easier Impact Safety Analysis
- Module design remains flexible
- Wireless BMS Integrated

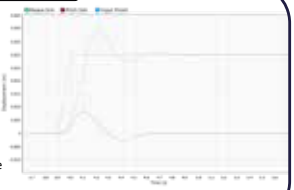
Optimized Components and strategy
Providing sufficient redundancy while saving energy

- Single loop liquid cooling
- Optimal radiator dimensions
- Pump: Davies Craig EBP15



Vehicle Dynamics and Suspension Design

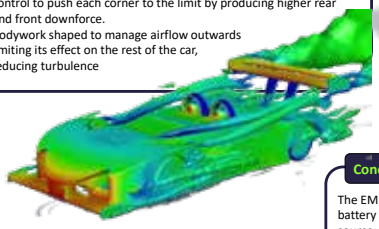
- Hankook Ventus F200 slick tyres
- Compact front and rear suspension for lightweight design
- Anti-Ackermann steering
- Low anti-squat and dive design
- Push rod setup
- Wheelbase increased for improved stability
- Extended rear suspension arms for enhanced stability
- Analysed and optimised suspension response to heave and pitch
- 7 degree of freedom SimuLink model for analysis



Aerodynamics

Advanced aerodynamic design and development creating a car able to generate an overall downforce of 788 kg at top speed achieving an aerodynamic efficiency of 3.27.

- Stable centre of aerodynamic pressure. Delivery of a consistent handling feeling
- Adjustable front and rear wing. Adaptable aerodynamic performance
- Highly-developed underbody aerodynamics. Achievement of top control to push each corner to the limit by producing higher rear and front downforce.
- Bodywork shaped to manage airflow outwards limiting its effect on the rest of the car, reducing turbulence



Conclusion

The EMR1 is an improved design from its carbon fuelled alternative. The design satisfies all regulations set out by the regulating body and meets all safety requirements. A modular battery design is used to enable lower feeder series to use these batteries in the following season. Aluminium honeycomb casings provides a safe, lightweight and cost-effective energy source. The vehicle aerodynamics are refined and enhanced to provide optimal downforce and ensure the cooling system works efficiently so all components operate at optimal temperature. The powertrain, chassis and suspension are well integrated to the power delivery system and deliver a well-designed and competitive competition vehicle.

Authors: Nicholas Gammage, Enrique Gómez Vázquez, Gianni ter Haar, Jamie Hilton, Jiafan Li, Dheiraj Mikkilineni, Germain Picard, Arturo Pol Gutierrez, Jorge Rego Olivo, Xavi Valls Santafe, Yolandi Watkins

Cranfield University, SATM, College Road, Cranfield, MK43 0AL

n.gammage@cranfield.ac.uk
e.gomez-vazquez@cranfield.ac.uk
jamie.hilton@cranfield.ac.uk
jiafan.li@cranfield.ac.uk
d.mikkilineni@cranfield.ac.uk
germain.picard@cranfield.ac.uk
arturo.pol-gutierrez@cranfield.ac.uk
jorge.rego-olivo@cranfield.ac.uk
g.ter-haar@cranfield.ac.uk
xavi.valls-santafe@cranfield.ac.uk
y.watkins@cranfield.ac.uk

www.motorsport.cranfield.ac.uk

AVL Racecar engineering

motorsport UK

RADICAL

Image courtesy of Radical Sportscars Limited

E-Motive Racing

Nicholas Gammage

Enrique Gomez Vasquez

Jamie Hilton

Jiafan Li

Dheiraj Mikkilineni

Germain Picard

E-Motive Racing

Arturo Pol Gutierrez

Jorge Rego Olivo

Gianni ter Haar

Xavier Valls Santafe

Yolandi Watkins

Nicholas Gammage

07432084005 n.gammage@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

A multidisciplinary engineer with an interest in innovative engineering. Fast-paced and exciting engineering has been a driving force which has led to the completion of a degree in aerospace engineering and continuing education by undertaking a master's degree in Advanced Motorsport Engineering. Motivated individual who can work well independently or as part of team. Strong communication, coordination, and analytical abilities, with experience putting academic learnings into practice in industry.

KEY ACHIEVEMENTS

- Graduated with a first-class honours degree in Aerospace Engineering with a Year in Industry from Swansea University with an average of 78%
- Achieved a first in final year project based on development of front wing of a formula student car, enabling an increase in aerodynamic efficiency, allowing the car to perform better during the competition
- Received highest peer review marks from final year group design project and led group to achieve a working, robust design and deliver a final report
- Directed the design of a 36,000 RPM test vessel and drove the project from initial design, through to final product, manufacture and test

EDUCATION

MSC Advanced Motorsport Engineering: Cranfield University, Cranfield, UK (January 2020 - Present)

- **Modules:** Motorsport Powertrains, Motorsport Electronics and Data Acquisition, The Business for Motorsport, Motorsport Aerodynamics, Computational Fluid Dynamics for Motorsport, Motorsport Structural Analysis, Composite Structures for Motorsport, and Motorsport Vehicle Dynamics
- **Group Design Project:** Design of an electric sportscar for international championship events

BEng Aerospace Engineering with a Year In Industry: Swansea University, Swansea, Wales (September 2016 - July 2020)

- **Year 1:** Average of 65%. Course modules include Analysis, Introduction to Aerospace Engineering, Engineering Mechanics, Thermodynamics, Fluid Mechanics
- **Year 2:** Average of 71%. Including 87% in flight mechanics, 74% in aerodynamics, 85% in engineering design 2, 84% in rocket and space technology, and 65% in thermodynamics 2. Overall, attained a first in 6 modules
- **Year 3:** Average of 82%. Accomplished a first in 8 out of 9 modules, and 69% in remaining module, including 87% in Gas Dynamics, 80% in Dynamics 2, 94% in Engineering Management, and 69% in Propulsion
- **Group Design Project:** Design a space craft for a test flight for Reaction Engine's sabre engine. Working on aerodynamics was complicated as Mach 4 had to be reached with an altitude of 24km
- The project was finished and was shown to work in simulations
- Led fortnightly meetings with tutor to present new ideas, ensure progress was being made and to ask questions when necessary
- Chosen to be chief engineer during final write up and had to build final report ensuring consistency throughout
- Obtained 84%, along with highest peer marking score from group
- **Final Year Project:** Improve downforce of formula student car by adding a front wing and developing it utilizing a combination of experimental and computational methods
- Employing CFD, font wings were designed and simulated to be able to compare to experimental data. A scale model was 3D printed for testing in a wind tunnel
- The wind tunnel results agreed with the 2D and 3D CFD results and therefore was deemed a success as downforce increased, without increasing drag by a significant amount.

CAREER HISTORY

Compact Orbital Gears: Trainee Design Engineer: Rhayader, Wales (July 2018 - July 2019)
Compact Orbital Gears is a bespoke gear and test rig design and manufacturing company that provide prototyping and final products to a variety of industries.

- Underwent a year in industry during 3rd year of undergraduate degree allowing improvement of engineering skills immensely, and further boosted interest in high-performance engineering
- Created extremely high-performance equipment for a wide range of customers, including motorsport, aerospace, and manufacturing companies. Part of an experienced design team utilized CAD software and calculation packages daily
- Developed leadership skills by being project manager during first 6 months at Compact Orbital Gears. Delegated work to other team members and ensured everything was done to high standard, in allotted time
- Supervised and issued All CAD and engineering drawings to manufacture and tracked through to testing. Time management was extremely challenging as customers were promised an extremely early delivery date
- Managed communications between COG and important customers on various projects, allowing for customer relationships to be built. Communication with over 10 suppliers when investigating components was also critical
- Accomplished engineering drawings taking a project from prototype design, to a finished product. CAD and engineering drawing skills had to be impeccable to attain expected delivery date
- Improved overall engineering skills. COG having a manufacturing workshop meant it was possible to witness parts issued from design go through manufacture, build, and test, and allowed for involvement in 4 test sessions
- Spent 1 day a week for 4 months in manufacturing workshops with machinists to better understand manufacturing processes
- Promoted and attended a careers fair for over 3,000 secondary school students to develop and discuss interest in engineering and presented to students on behalf of COG

Next plc: Summer Sales Assistant: Cwmbran, Wales (June 2015 – August 2015)
Next plc is a multinational clothing and home product retailer, with over 700 stores across the UK and other parts of the World.

- Refined the store layout with other members of staff to optimise the organisation of the store ready for the summer sale
- Worked with a team of 30 members of staff to ensure the smooth operation of the store throughout the summer
- Developed team working and communications skills with staff and customers alike when tackling day to day operations, or when issues arose

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages:** Fluent English
- **IT Skills:** Extremely capable in CAD software, including Autodesk Inventor and Solidworks. Competent at using CFD software, including Ansys. Proficient in Microsoft Office Software. Experience using MATLAB
- **Individual Interests:** Watching motorsport, including Formula 1 and WRC, playing and watching football, simulator racing, travelling and exploring new places, building computers, watching Esports
- **Volunteering:** Prefect on sixth form council during final year of sixth form, involved in organising and managing events and participated in fortnightly meetings regarding any issues. Performed various admin tasks for Sight Cymru, a local charity aimed at helping people with sight loss
- **Memberships:** Student member of IMechE. Member of Swansea University Formula Student team, helped with CAD design and simulation set up
- **Professional training:** Attended and completed the British Gear Association’s gear foundation day as part of training for industry experience at COG
- **Other Achievements:** Received a Gold award at the UKMT senior maths challenge

Enrique Gómez Vázquez

+34 6 55 450177 e.gomez-vazquez@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

A committed, methodical and enthusiastic Automotive and Mechanical Engineer pursuing an MSc in Advanced Motorsport Engineering. Work experience at BMW AG Spain, provided technical knowledge and understanding of the automotive industry, as well as development of problem-solving and decision-making skills in a highly demanding environment. Completion of several projects during bachelor degree, with focus on thermodynamics and structural analysis, showcased technical abilities and experience with software such as CATIA V5, ANSYS, ThermoFlow, AVL Boost and MATLAB/SIMULINK. Experience as a basketball player and role within a customer service environment, enhancing communication, teamwork and leadership skills.

KEY ACHIEVEMENTS

- Graduated in Mechanical Engineering at University Carlos III of Madrid (June 2019).
- Graduated with Honours in Internal Combustion Engines (100% final exam, 95% module assignment), Vehicle Theory (90% module assignment), Numerical Simulation of Industrial Flows (89%), Renewable Energy Systems (82%), Writing and Communication Skills (90%) and Courses of Humanities (85%).
- Industrial Placement at BMW AG Spain. Conduction of over 200 daily customer quotes and queries regarding spare parts replacements, billings and type approvals.
- Certified in CATIA V5 by Dassault Systemés via the Superior Course in Industrial Design with CATIA V5 at CEPPe. April 2020
- Certified in ANSYS FEA and CFD by Cornell University via the course A-Hands on Introduction to Engineering Simulations. December 2020
- Diploma of Excellence for Bachillerato en Ciencias Aplicadas (equivalent to UK Applied Sciences A-Levels) by the Community of Madrid. 2014
- Diploma of Excellence for Educacion Secundaria Obligatoria ESO (equivalent to Compulsory Secondary Education) by the Community of Madrid. 2012
- Certificate in Advanced English (CAE) by Cambridge Institute. Grade: 198/210. Level C1. October 2018.
- DELF A2 Certificate by Institut Français via DELF Certificate exam. Grade A+. Level A2. August 2012.

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, Cranfield, UK (September 2020 - Present)

- Projected to graduate with 1st Class Honours.
- Modules: Induction and Introduction to Motorsport, Motorsport Structural Analysis, Motorsport Electronics and Data Acquisition, Motorsport Vehicle Dynamics, Motorsport Aerodynamics, Computational Fluid Dynamics for Motorsport, The Business of Motorsport, Composite Structures for Motorsport, Motorsport Powertrains.
- Member of the F1 Design Sprint project related to the development of a F1 engine. Charge Air Cooler, Turbocharger and MGU-H department.

BEng Mechanical Engineering: Universidad Carlos III of Madrid, Leganés, Spain (September 2014 - June 2019)

- Graduated with Upper Second-Class (2:1) Honours.
- Relevant Modules: Engineering Graphics, Information Skills, Writing and Communication Skills, Materials Science and Engineering, Electrical Power Engineering Fundamentals, Engineering Fluid Mechanics, Thermal Engineering, Mechanics of Structures, Machine Mechanics, Production and Manufacturing Systems, Environmental Technology, Introduction to Engineering Management, Thermal Systems Design, Fluid Installations and Hydraulic Machinery, Power Plants and Heat Engines, Strength of Materials, Materials Technology, Mechanical Technology, Machine Theory, Vehicle Theory, Heat Transfer, Structural Dynamics, Renewable Energy Systems, Internal Combustion Engines, Numerical Simulation of Industrial Flows, Machine Design, Industrial Design, Technical Office: Mechanical Engineering Projects, Industrial Organization, Structures and Industrial Constructions Theory, Solid Mechanics.
- Specialized in Thermodynamics and Internal Combustion Processes
- Individual Thesis: Analysis of a Two-Pressured Combined Cycle Power Plant with ThermoFlow

Bachillerato en Ciencias Aplicadas (equivalent to UK Applied Sciences A-Levels): Colegio San Juan Bosco, Torrejón de Ardoz, Madrid (September 2012 – June 2014)

- Graduated with an average grade of 8.95/10 (equivalent to AAA Honours)
- Specialized and Most Relevant Modules: Mathematics, Physics, Technical Drawing
- Compulsory Modules: Philosophy, Spanish History, Spanish Literature and Language, English, Physical Education
- Awarded with the Diploma of Excellence by the Community of Madrid.

Superior Course in Industrial Design with CATIA V5: CEPPe, Leganés, Madrid (March 2020 - April 2020)

- Modules: Introduction to CATIA V5, Mechanical Parts Design, Surface Design, Assembly Design and Management, Generation of Manufacturing and Assembly Drawings, Sheet-Metal Parts Design, CATIA V5 DMU Space Analysis, CATIA V5 DMU Kinematics, Rendering and Photorealistic Visualization.

A Hands-On Introduction to Engineering Simulations: Cornell University, Online (December 2020)

- Introductory course with a focus on different structural-analysis simulations using ANSYS Mechanical and Fluent, applying Finite Element Analysis and Computational Fluid Dynamics principles and methods.

CAREER HISTORY

BMW AG: Madrid, Spain - Technical Advisor Internship (June 2019 - October 2019)
Spanish division of the German car manufacturer BMW

- Led technical management of repairs, determination and order of spare parts, creation of billing procedures and study and authorization of type approvals. Around 200 customers and quotes attended per day.

IMOP Encuestas: Madrid, Spain - Telephone Pollster (April 2018 - June 2018)
Leading company in the conduction of surveys related to media

- Completed more than 25 daily surveys related to printed and digital newspaper consumption and use of mobile phone applications created by national-leading newspaper companies.

Self-Employed: Torrejón de Ardoz, Spain - Private Teacher (September 2015 - June 2017)
No description

- Tutored several students to achieve desired results at Selectividad (Spanish University Access Test), taught English, Physics, Mathematics and Technical Drawing.

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages**: Spanish (Native), English (Full Professional Competences), French (Entry-level proficiency)
- **Software Knowledge**: MATLAB/SimuLink, CATIA V5, Solid Edge, ANSYS, Fluent, MathCad, ThermoFlow, Microsoft Office Suite (Word, Excel and PowerPoint), AVL Boost
- **Main Interests**: Motorsport & Automotive industry (Having restored several cars for track day purposes along my friends at CHAICOM Motorsport), Fashion, Furniture and Interior Decoration, and Basketball
- **Other interests**: Travelling, Watches, Architecture, Industrial Design, Black Music (Culture and creation)
- **Basketball**: Played from age 6 to 17, taking part of two high-level teams in Community of Madrid
- **Swimming**: Member of local swimming team from 2005 to 2010
- **Non-professional work**: Creation and development of a network of people specialized in the curation of sought-after footwear and clothing items, facilitating its subsequently sale
- **Driving licenses**: B

Jamie Hilton

+44 7943 411561 jamie.hilton@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

A professional data analyst and MSc Advanced Motorsport Engineering student with 5 years of experience presenting data insights. Working with successful F2 team UNI-Virtuosi Racing to analyse performance throughout the 2021 season. Skilled in communicating complex ideas effectively, adapting style to suit the technical background of the audience. A trusted leader who thrives under pressure, experienced in developing successful teams. Previously head of department for data at THG, optimising marketing strategy for selling nutrition products direct to online consumers.

KEY ACHIEVEMENTS

- Directed the strategy for data analytics at THG. Onboarded over 10 analysts and nurtured their talent.
- Designed a predictive data model for valuing social media influencers, contributing to THG winning “Best Use of Data” (International Performance Marketing Awards 2019).
- Realised £400k in annual cost savings for THG’s referral scheme, supported by data-driven testing.
- Developed a simplified race strategy model during weekends, modelling tyre degradation and fuel effects.

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University (September 2020 – September 2021)

- **Modules**: Motorsport Electronics and Data Acquisition, Motorsport Vehicle Dynamics, Motorsport Aerodynamics, Computational Fluid Dynamics for Motorsport, Motorsport Powertrains, The Business of Motorsport, Motorsport Structural Analysis, Composite Structures for Motorsport.
- **Group Design Project**: Design of an electric sportscar for a proposed new international race series.
- **Individual Thesis**: Topic to be confirmed.

MA Mathematics (1st Class): University of Cambridge (October 2012 – June 2015)

- **Modules included**: MATLAB Computational Projects (97% average score), Statistical Modelling, Principles of Statistics, Fluid Dynamics, Stochastic Financial Models.
- Achieved 1st class in all 3 years of study.

CAREER HISTORY

Virtuosi Racing: Attleborough, UK – Engineering Intern (March 2021 – Present)
Virtuosi Racing runs a leading Formula 2 squad. Won the 2017 teams’ championship (as Russian Time).

- Engineering of live timing data to facilitate strategy calculations for the 2021 Formula 2 season.
- Conducting in-race analysis of radio messages and TV feeds.
- Analysing timing data and tyre degradation characteristics after each session.

THG: Manchester, UK
THG is a global leader in ecommerce, managing the websites of renowned beauty and nutrition brands such as Myprotein. Sells products direct to consumers. £1.1bn+ annual turnover and 7000+ employees as of 2019.

Head of Customer Science (March 2019 – September 2020)

- Led data analytics for THG's Nutrition and Central Marketing divisions. Onboarded, mentored and managed 10+ analysts over 18 months.
- Designed a model with Excel VBA and Python to predict return on investment for social media influencers. Accelerated investment into influencers, resulting in over 100% growth within 12 months.

Lead Customer Scientist (March 2017 – February 2019)

- Established a new data analytics team within THG's Nutrition division. Expanded from 1 to 7 analysts within two years, and prioritised workload towards high-value, high-impact projects.
- Scrutinised the effectiveness of THG's customer referral scheme. Devised tests on multiple sites to validate optimal credit incentive values. Recommendations resulted in a £400k annualised cost saving.
- Awarded Outstanding Contribution of the Year 2018 (Nutrition division).

Customer Scientist (April 2016 – March 2017)

- Devised new measurement techniques for customer loyalty. Presented recommendations for THG's subscription box businesses to group CEOs. Inspired a step change in strategy, away from expensive new customers and towards customer retention.
- Awarded Employee of the Month in June 2016 (3rd month at THG). Also named Newcomer of the Year 2016 (Marketing & Data).

Advanced: Knutsford, UK – Data Analyst (September 2015 – April 2016)

Advanced is a B2B computer software solutions provider with £250m+ annual turnover as of 2019.

- Developed new methods to accurately calculate and forecast customer retention rates. Shaped a change in strategy to migrate customers away from legacy software.
- Reported on month-end financials and recurring revenue forecasts. Leveraged Excel VBA to streamline processes, saving approximately 10 hours per week of manual work.

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Coding Skills**: Python, SQL and MATLAB. Basics of Excel VBA for task automation. Basics of C# and WPF using .NET framework in Visual Studio.
- **Motorsport Software**: AVL Boost, Cosworth Pi Toolbox, Ansys Fluent, Altair HyperMesh.
- **Other IT Skills**: Data visualisation tools such as Tableau. Data engineering via Google Cloud Platform (including BigQuery). Basics of Machine Learning in Python. Arduino real time control loop programming.
- **Individual Interests**: Motorsport, particularly open-wheel formulae. Track days, including preparing the car and meeting like-minded enthusiasts. E-sports, having volunteered to co-lead a team (SqR) to competitive sim racing success. Computing.
- **Projects**: Created a simplified race strategy model using Python, over weekends whilst working full-time. Utilised publicly available F1 data via the Ergast API to fit quadratic tyre degradation and fuel effect models. Visualised how different tyre characteristics impact optimal strategy choice.

Jiafan Li

+44 7851 882195 jiafan.li@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

A motorsport engineering postgraduate student with strong learning ability, analytical ability, solid mathematical background and professional engineering knowledge background. A junior engineer of a single-seater formula car with rich practical experience. An engineering enthusiast with strong hands-on ability, willing to participate in practice and application knowledge, and with strong engineering intuition. A team player good at grasping the focus of tasks in large-scale projects with complex processes and has project management capabilities. Logical in communication, good communication skills in English.

KEY ACHIEVEMENTS

- As a race engineer of ZEN Motorsport, participated in the highest-level professional racing championship in Asia, the F3 Asian Championship for 2 consecutive seasons. As the only low-budget team in the paddock, supported team's young Chinese driver for continuous success.
- As data engineer and team manager assistant of Audi Sport Asia Team TSRT, participated in the 2019 FIA GT World Cup, represented the team manager in all meetings and analysed the data.
- During the undergraduate period, participated in Formula Student China as a core team member for 4 consecutive years. As project manager, managed the annual time nodes and technical goals of a team of more than 20 people; as a driver, won top ten in the events attended.

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, UK (September 2020 - September 2021)

- **Modules**: Composite structures for motorsport, Computational fluid dynamics for motorsport, Motorsport aerodynamics, Motorsport electronics and data acquisition, Motorsport powertrain design, Motorsport structural analysis, Motorsport vehicle dynamics, The business of motorsport.
- **Group Design Project**: Cranfield “Corona Charge” Electric Radical Race Car Design Project: involves designing a complete electric race car, including areas such as fully electric powertrain, aerodynamics and structure. Current focus lies in electronics and controlling.
- **Individual Thesis**: Structural analysis related topic

BEng Mechanical Engineering: Tsinghua University, Beijing, China (August 2014 - July 2019)

- **Modules**: Theoretical Mechanics, Theory of Design and Manufacturing, Measurement and Instrumentation, Automotive Structures, Automotive Engine Fundamentals, Automotive Powertrains.
- Selected to enrol in first “elite class” (24 out of 160 students) of the Dept. of Mechanical Engineering
- Awarded “Tsinghua Technological Innovations Scholarship” in sophomore year

CAREER HISTORY

ZEN Motorsport: Shanghai, China – Race Engineer (April 2019 - March 2020)
(Participating in Formula 3 Asian Championship)

- Processed and analysed data and video to give advice on vehicle setup and driver coaching for professional driver.
- Performed vehicle setup according to team’s decision.
- Configurated the electronic system and supervised the maintenance of electronic and transmission system of the race cars.
- Conducted simulations regarding the suspension system to help theoretically predict the dynamic behaviour of the race car.
- Supported chief engineer with race strategy development and team management.

Audi Sport Team Asia TSRT: Macau, China – Data Engineer and Team Manager Assistant (November 2019)
(Participating in 2019 FIA GT World Cup)

- Analysed data and video to support vehicle setup and maintenance. Monitored the status of engine and transmission system.
- Attended all team manager meetings and driver briefings on behalf of team manager. Supported team manager and chief engineer with team management and media affairs.

Audi (China) Enterprise Management Co. Ltd.: Beijing, China – Intern, Overall Vehicle Development: Country Specific Testing and ADAS (October 2018 - March 2019)

- Conducted several special overall vehicle testing regarding traffic sign recognition system, adaptive cruise control system and parking assistance system and made reports for problems found.
- Conducted testing for new energy vehicles regarding country specific topics such as charging and route planner.
- Supported daily testing and fleet management.

Daimler Greater China Ltd.: Beijing, China – Intern, Overall Vehicle Testing: Integration Powertrain (July 2017 - September 2017)

- Developed a localized vehicle testing documentation system with Excel to record testing results and continue tracking issues.
- Performed all steps on an auditing and pre-checking checklist to vehicles of a new carline before entry into R&D testing stage.
- Supported daily overall vehicle testing regarding powertrain system, specifically, spotted causes and projected solutions to a problem with exhaust pipe rattling noise.

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages**: Chinese (native), English (full professional proficiency/TOFEL 101), German (elementary).
- **IT Skills**: Confident IT user. Skilled in Solidworks, Microsoft Office. Experienced with Altium Designer, Catia, HyperMesh Optistruct, ANSYS, Matlab, MoTeC Systems, Marelli WinTAX4, Bosch WinDarab
- **Programming:** Basic knowledge and programming skill in C/C++.
- **Driving license:** China (Full Manual and Motorcycle), UK (Provisional)

Dheiraj Mikkilineni

+44 07708 390010 d.mikkilineni@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

A zealous, organized, and punctual engineering graduate seeking an opportunity to prove caliber by adding value to the organization working for, through exploration, innovation, and implementation of solutions using technologies. Currently pursuing MSc. in Advanced Motorsport Mechatronics aiming to translate the knowledge and experience from mechatronics into motorsport. Eager to enhance knowledge and work towards making an impact in motorsport where passion lies. Possessing strong teamwork skills from the various internships and voluntary work and can blend into any new team and focus on maximising teams' output.

KEY ACHIEVEMENTS

- Merit-based academic scholarship by SRM Institute of Science and Technology (2017, 2018, 2019)
- Certifications in Python, MATLAB, Tableau and Machine learning
- FIDE rated chess player

EDUCATION

MSc: Advanced Motorsport Mechatronics, Cranfield University, Cranfield, UK (September 2020 - Present)

- Modules of interest: Motorsport electronics and Data acquisition, Mechatronics modelling for vehicle systems, Motorsport vehicle dynamics, Motorsport powertrains, Embedded vehicle control systems
- Group Design Project: Member of the Chassis team (team of 6) working on an open cockpit racecar design similar to a Radical RXC Spyder

Btech: Mechatronics, SRM Institute of Science and Technology, Chennai, Tamil Nadu (June 2016 - May 2020)

- GPA : 8.1/10
- Scholarship for every year of study
- Major project: Proof of concept project (team of 3) on regenerative braking and possible implications in commercial vehicles

CAREER HISTORY

Posh Automats: Chennai, Tamil Nadu - Intern (July 2018 - December 2018)
Posh Automats was started in the year 2012 having committed to reduce and improve human efforts in various manufacturing environment of Automotive and Non-Automotive. Manufacturing solutions in designing of assembly lines with data collection, customised analysis tools and display systems.

- Designed various mechanical installations for part handling using CATIA.
- Fabricated all part designs as a team of 3 and installed into framework of special purpose machine.
- Performed installation of various sensors and pneumatic systems into body of the SPM as a team of 5.
- Managed development of PLC Ladder system with help of electronics team for design of control system of special purpose machine.
- Executed working trials on special purpose machine and implemented necessary design corrections and mounting alterations as a team of 3.

Central Institute of Tool Design: Hyderabad, Telangana - Intern (May 2018 - June 2018)
MSME tool room - CITD, Hyderabad established in 1968 by the government of India with the assistance of UNDP and ILO, is a pioneering Institution in the field of Tool Engineering in the Country.

- Cultivated prime skills in mechatronics and fluid power systems by working in field of machine automation.
- Took part in industrial training program of CITD as a part of a 15 members group.
- Completed certification courses on python programming and mechatronics.

Akshaya Patra: Bangalore, Karnataka - Intern (June 2017 - June 2017)
The Akshaya Patra Foundation is a non-profit organisation in India that operates a school lunch programme. The organisation was established in 2000. It aims to counter classroom hunger and aid in education of children. It feeds 1,800,907 children every day across India.

- Interned to manage ERP data handling and maintained daily log of various food trucks in network going around city feeding children of more than 50 government schools.

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages:** English (Fluent), Telugu (Native), Hindi (Fluent), Tamil (Good), Kannada (Good), German (Basic).
- **IT Skills:** MATLAB, SolidWorks, CATIA, Python, AVL Boost, Microsoft Office Suite (Word, Excel, Powerpoint), Tableau.
- **Volunteering:** Took part in India's first energy conservation conference and Model United Nations.
- Volunteered as an art teacher, for a batch of 15 kids affected by cancer, during weekends.
- Writing Formula 1 weblogs.

Germain Picard

+33623456285 Germain.Picard@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

Advanced Motorsport Engineering MSc student with academic and professional experience in Automotive, Aeronautics and Motorsport. Fluent French and English speaker with an intermediate level of Spanish. Exhibits teamwork, management skills gained by being involved in student teams, projects and internships and gained exposure to F1 requirements through Powertrain Design Sprint. Strong ability to adapt to new working methodologies and culture. Ready to face challenges of tomorrow.

KEY ACHIEVEMENTS

- Double degree at ENSTA Bretagne, Architecture Vehicle Speciality and at Cranfield University in Advanced Motorsport Engineering.
- Managed ENSTA Bretagne Eco-Marathon Team for one year to design and create an electric car with highest energy efficiency possible.
- Produced a tool estimating additional surface area created by cavities in solid-propellant rocket engine for DGA Essai de missiles,the French Government Defence agency responsible for development and purchase of weapons.
- Involved in “F1 Powertrain Design Sprint”(Cranfield University) extracurricular project aiming to design a F1 powertrain simulation using AVL Boost. Analysed tuning and anti-tuning properties.

EDUCATION

MSc in Advanced Motorsport Engineering: Cranfield University, Cranfield, UK (October 2020 - September 2021)

- **Modules:** Composite Structures for Motorsport, Computational Fluid Dynamics for Motorsport, Motorsport Aerodynamics, Motorsport Electronics and Data Acquisition, Motorsport Powertrain Design, Motorsport Structural Analysis, Motorsport Vehicle Dynamics, The Business of Motorsport.
- **Group Design Project:** To be decided.
- **Individual Thesis:** To be decided.
- **Extracurricular activity:** F1 Powertrain Design Sprint 2020, a student-led activity designing a F1 powertrain using AVL Boost.

French Engineering Diploma equivalent to a MSc Degree: ENSTA Bretagne, Brest, France (September 2018 - August 2020)

- Engineering Master of Science, Vehicle Architecture Speciality, in a French Graduate and Post Graduate Engineering School and Research Institute and Doctoral College.
- Main Modules: Fluid Mechanics, Thermodynamics, Vibration Analysis, Signal Analysis, Materials Science, Statistics and probability, Finite Element Analysis, Composite Structures, Electronics, System Engineering, Power Transmission, Vehicle Dynamics, Finance, Management.

Preparatory Classes: François 1er, Le Havre, France (September 2015 - June 2018)

- Intensive preparation in advanced Mathematics and Science for competitive entrance examinations to French graduate engineering schools.

CAREER HISTORY

F1 Design Sprint: Cranfield University, UK - Student-led Project (October 2020 - December 2020)
Student-led extra-curricular activity aiming to model a F1 Powertrain with AVL Boost.

- Characterised tuning, un-tuning and anti-tuning properties and impact on performances.
- Designed an anti-tuned model of engine with AVL Boost in order to improve efficiency.

DGA ESSAI DE MISSILES: St Médard-En-Jalles - Internship (July 2020 - August 2020)
Direction Générale de l'Armement : the French Government Defence agency responsible for development and purchase of weapons.

- Designed and implemented a tool estimating additional surface area created by cavities in propellant load using Matlab and VBA in order to study impact on thrust.
- Characterised impact of cavities in engine loading. Burned propellant mass, Surface exposed to combustion front, pressure discontinuity were main parameters studied.

PSA Peugeot Citroën: Rennes - Student Project (January 2020 - April 2020)
French multinational automotive Manufacturer

- Studied mechanical properties of a Vacuball and its advantage on a work chain.
- Realised a numerical model with Catia improving its compactness without altering its properties.
- Implemented a yield model on Abaqus using Drucker-Prager criterion to determine Vacuball's material properties.

Thales: Brest, France - Student Project (September 2019 - February 2020)
French multinational company that designs systems for aerospace, transportation, defence and security markets.

- Designed a system for deploying and towing a SONAR. Elaboration of specifications, choice and sizing of a mechanism.
- Developed state-of-the-art of architectures already used to deploy systems in marins conditions.
- Developed a numerical solution with Catia and Structural Analysis with Abaqus.

ENSTA Bretagne project: Brest, France - Student Project (May 2019 - June 2019)
Student Project in ENSTA Bretagne.

- Analysed a SCANIA truck gearbox to determine engine mapping and maximum speed reached at each gear.
- Modelled actuators and implementation of a tool simulating an automatic gearbox with Python and Arduino.

Renault: Flins, France - Industrial Placement (January 2019 - January 2019)
French multinational automotive manufacturer

- Supervised a part of assembly line: laying ceiling and wires and positioning electrical cables for Zoe, Micra and Clio models. Discovering workers importance and working conditions.
- Examined work station optimisation and supervise of cars with failures at end of work chain.

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages:** French (Native), fluent English, Spanish (Intermediate)
- **IT Skills:** Experienced with Office software, Python and Linux languages, Matlab, Abaqus, Ansys Fluent, Solidworks, Catia V5 and Amesim.
- **Individual Interests:** passionate in motorsport, participation in Marathon Shell Project: managed engine performance, cycling and tennis in competition for six years.
- **Volunteering:** Cabin boy in an association aiming to give access to marine environment to everyone.

Arturo Pol Gutierrez

+44 0770 9210191 arturo.pol-gutierrez@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

A practical and forwarded thinking Engineer with great interest in the Motorsport industry. Exhibits strong perseverance to achieve challenging project goals with analytical and organizational abilities proved during the Formula Student venture and currently studying a double master's degree program focused on industrial engineering and motorsport mechatronics. A native Spanish and fluent English speaker with outstanding communication skills. An applicant capable of delivering results under pressure applying engineering techniques and know-how to give solid grounds. A team player committed to the company goals.

KEY ACHIEVEMENTS

- Two times participant of Formula Student Germany (one of the best Formula Student competitions around the world) in August 2017 and August 2018. Highlighting a 7th position in overall results of 2017 competition, as member of ETSEIB Motorsport team
- As member of ETSEIB Motorsport, team was awarded as Best Spanish Team of Formula Student Spain 2017 competition

EDUCATION

MSc Advanced Motorsport Mechatronics: Cranfield University, Cranfield, UK (September 2020 - Present)

- **Modules:** Induction and Introduction to Motorsport, Motorsport Electronics and Data Acquisition, Motorsport Vehicle Dynamics, Vehicle Control Applications, The Business of Motorsport, Motorsport Powertrains, Mechatronics Modelling for Vehicle Systems, Advanced Control and Optimisation, Embedded Vehicle Control Systems.
- **Group Project:** TBC
- **Thesis:** TBC

Master's degree in Industrial Engineering: ETSEIB, Polytechnic University of Catalonia, Barcelona, Spain (September 2019 - Present)

- **Modules:** Industrial Scheduling, Machine Elements Calculation, Process Control, Extended Electronics, Electrical Technology, Theory of Structures and Machine Technology. Current modules: Business and Organization Management, Integrated Manufacturing Systems, Constructions and Industrial Architecture, Thermal Machines, Hydraulic Machines, Chemical Technology, Human Resources, Energy Technology and Installations.

Bachelor's degree in Industrial Technology Engineering: ETSEIB, Polytechnic University of Catalonia, Barcelona, Spain (September 2012 - June 2019)

- **Modules:** Linear Algebra, Fundaments of Informatics, Chemistry I, Calculus I, Basic Mechanics, Engineering, Basic Thermodynamics, Engineering Drawing, Basic Thermodynamics, Chemistry II, Calculus II, Geometry, Informatics, Mechanics, Differential Equations, Materials, Electromagnetism, Numerical Methods, System Dynamics, Machine and Mechanism Theory, Project I, Statistics, Economics and Business, Human Preparation for Workplace, Technology and Selection of Materials, Statistical Techniques for Quality, Continuum Mechanics, Environmental Technology and Sustainability, Thermodynamics, Electrotechnics, Electrical Machines, Optimisation and Simulation, Project II, Organisation and Management, Strength of Materials, Fluid Mechanics, Heat Technology, Automatic Control, Electronics, Manufacturing Systems and Project Management.
- **Group Design Project:** Formula Student
- **Individual Thesis:** Design, analysis and construction of elements form the ergonomics of a Formula Student car'. The aim of project was to achieve manufacturing of functional parts seat, steering wheel and driver's restraint system for a Formula Student car. Innovative technologies were used like 3D Scanning to obtain an ergonomic geometry for seat. FEM simulations were performed to determine the lay-up of carbon fibres in resin matrix.

CAREER HISTORY

Private Tutor for High School Students: Barcelona, Spain - Mathematics and Physics Teacher (October 2018 - June 2020)

- Taught Mathematics and Physics. All students were able to attain grades greater than 80% which enabled them to access university studies successfully.

ETSEIB Motorsport: Barcelona, Spain - Responsible for Ergonomics (September 2016 - August 2018)
Collaborated in The Formula Student team, ETSEIB Motorsport. Formed by undergraduate engineers, the team has developed, during his 13 years of history, combustion and electric cars.

- Designed an ergonomic concept for a single-seater car utilizing 3D Scanning and CAD design. Obtaining good feedback from the design contest of the Formula Student competitions.
- Devised and produced seat deploying 3D Scanning technology and 3D modelling using CAD and FEM simulations were performed via Altair HyperWorks Optistruct to determine lay-up of carbon fibres in resin matrix.
- Created and constructed steering wheel. The major piece was hollow, creating housing for electronic parts. Built of Carbon Fibre reinforced resin. Positive feedback received from drivers as performance improved.
- Designed and produced headrest made of impact absorber foam with adjustable position to fit different drivers.
- Collaborated as part of the Body department in manufacturing of monocoque chassis via Pre-preg carbon fibre and aluminium honeycomb.

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages:** Native Spanish, Fluent English, and Basic German
- **IT Skills:** IT user. Experienced Microsoft Word, Excel, PowerPoint, SolidWorks, ANSYS Mechanical, Altair HyperWorks Optistruct, MATLAB/Simulink, and knowledge of AutoCad, Rhinoceros 3D, AVL Boost and Python programming
- **Individual Interests:** Motorsport, rugby, playing tennis. Enjoy exploring new cultures: travelled across Europe, United Kingdom and United States

Jorge Rego Olivo

+34 652374875 jorge.rego-olivo@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

A determined, motivated aeronautical engineer passionate about the motorsport world and currently studying the Advanced Motorsport Engineering MSc at Cranfield University. Reached excellence throughout education and professional career due to an analytical and practical approach to any issue. Used to working side by side with other people accomplishing astounding results, thanks to communication skills with fluency in Spanish, English and French. Acquired hands-on engineering experience in motorsport environment during participation in Formula SAE competition as a chassis developer. Proven strengths include strong work ethic and organisation.

KEY ACHIEVEMENTS

- Designed and implemented a monocoque chassis made from carbon and glass fibre for a formula-type car competing in three 2018-2019 Formula SAE competitions
- Carried out experiments in a wind tunnel and simulations with CFD at ISAE ENSMA (Poitiers, France), attaining optimal distance between two cars to get at minimum combined drag (platooning)
- Developed a scientific research consisting of numerical and experimentally analysis of an unsteady flow around one circular cylinder at UPM (Technical University of Madrid, Spain), broadening knowledge in non-steady aerodynamics. Presented results before aerodynamics professors
- Concluded High School with honours and awarded scholarship to the Technical University of Madrid in 2015

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, Cranfield, UK (October 2020 - September 2021)

- **Modules:** Composite structures for motorsport, Computational fluid dynamics for motorsport, Motorsport aerodynamics, Motorsport electronics and data acquisition, Motorsport powertrain design, Motorsport structural analysis, Motorsport vehicle dynamics, The business of motorsport.
- **Group Project:** full design of a Radical-type electric race car.
- **Individual Research Project:** Topic TBC

MSc Aeronautical Engineering: Technical University of Madrid (UPM), Spain (September 2019 - July 2020)

- Completed first full year out of two (60/120 ECTS).
- **Modules:** Advanced Aerodynamics, Flight Dynamics, Advanced Fluid Mechanics, Advanced Materials and Production, Optimization and Control, Design of Airbreathing Engines, Advanced Structures, Design and Certification of Aircrafts and Space crafts, Aerospace Electronic Systems.

BEng Aerospace Engineering: Technical University of Madrid (UPM), Spain (September 2015 - September 2019)

- Specialised in Aerospace Sciences and Technologies, acquiring knowledge regarding research, materials used in aeronautical industry and space technology as well as on air and mechanical propulsion systems.
- **Scientific modules:** Mathematics, Statistics, Classical and Analytical Mechanics, Orbital Mechanics, Flight Mechanics, Thermodynamics, Fluid Mechanics, Aerodynamics, Computational Aerodynamics (Ansys-Fluent), Aerospace Alloys, Composite Materials, Structures, Solid Mechanics, Vibrations, Aeroelasticity.
- **Engineering modules:** Electrical Engineering, Electronic and Automatic, Computer Science and Programming Languages, Numerical Methods, Optimization and Control, Technical Drawing (Catia), Aerospace Manufacturing, Airbreathing Engines, Aeronautical Reciprocating Engines, Rocket Engines.
- **Individual Thesis:** Study of oscillatory flow around a circular cylinder. Achieved highest possible mark (10/10).
- GPA: 3.1/4.0.

CAREER HISTORY

Cranfield University, Group Design Project: Cranfield, UK (January 2020 – May 2020)

Group Design Project consists of a full design of a Radical-type electric race car. Considering two seats, closed wheels and open cockpit, the design freedom ensures a great challenge while enhancing originality.

- Collaborated in a team of 11 international students, split into different departments so as to cover mainly the powertrain, chassis, suspensions and bodywork development
- Developed a full parametrised bodywork and chassis CAD in Solidworks during around 150 working hours, with more than 100 changeable parameters referring to overall geometry, aerodynamics and air cooling
- Optimised the aerodynamic performance of the car by analysing the effect of the geometry parameters in the rear wing, flat floor & diffuser and cooling ducts
- Considered different strategies for air cooling, with thermal efficiency and aerodynamic analysis of a number of intakes and their geometry

Ignacio da Riva Institute (IDR), UPM: Final Degree Project in Aerodynamics: Madrid, Spain (February 2019 – September 2019)
Ignacio da Riva Institute is an investigation and academic centre whose main goals are technological development and innovation within aerospace scope.

- Analysed unsteady velocity field of air around a circular cylinder and frequency and intensity of the forces applied on its surface
- Prepared and carried out experiments in an unsteady wind tunnel, able to generate a sinusoidal air flow
- Compared experimental results to CFD ones and to previous references
- Attained a model showing the relation between normalised flow speed and normalised frequency of wake swirls
- Calibrated and corrected CFD models in Ansys-Fluent to make them match case study
- Presented results before aerodynamics professors and obtained the highest mark (10 out of 10)

ISAE-ENSMA – Advanced Design Project (Bureau d'études): Poitiers, France (December 2018 – March 2019)
Advanced Design Project is a subject carried out with industrial partners, demanding mastery of one scientific domain. Students demonstrate technical expertise and ability to communicate and work in a team.

- Achieved, together with a fellow student, to minimise total drag generated by two aligned cars. (platooning)
- Completed wind tunnel experiments, controlling flow speed and utilising pressure gauges to study the wake flow
- Correlated experimental data with CFD results obtained with OpenFoam. Applied different turbulence models e.g. k-epsilon and k-omega SST and studied their influence in the results
- Documented all the work done and presented results to professor to permit future development of the idea by following cohorts

UPM Racing - Chassis Department: Madrid, Spain - Chassis Designer (September 2017 - June 2018)
UPM Racing is a project launched by the Technical University of Madrid (UPM) which aims to design a racing single-seater and participate in all Formula SAE competitions for Universities from all around the globe.

- Developed a monocoque chassis made from carbon and glass fibre instead of a tubular one for team's first time
- Designed from zero, adjusting to regulations and car's structural requirements
- Generated a CAD model of whole car, including joints between different parts
- Tested more than 50 jigs to establish carbon fibre properties as a strongly anisotropic material
- Associated experimental results with both laminate theory and FEM simulations
- Obtained a 20% weight reduction compared to previous tubular chassis
- Presented chassis department way forward proposal to increase success chances
- Learned a lot in terms of teamwork and project management

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages:** Native Spanish, Fluent English and Upper-Intermediate French after living 6 months in France
- **CFD/MEF:** Ansys-Fluent, OpenFoam, Nastran-Patran
- **Programming:** Matlab (inc. Optimisation Toolbox and Simulink), Fortran, Latex
- **Data analysis:** PI Toolbox, MoTec
- **Other IT Skills:** AVL Boost, Solidworks, CATIA, Microsoft Office
- **Mechanical knowledge:** collaborated in full redesign of a two-stroke engine; simplified mechanism and prepared a campaign to sell highlight new product enhancements at Technical University of Madrid (UPM)
- **Modelled and optimised** range of an aircraft by considering aerodynamical and structural interaction at UPM
- **Other awards:** earned second place award in a Spanish literature contest in High School
- **Volunteered** in a job fair at the Technical University of Madrid by helping participants with logistics and information requests
- **Sports:** played basketball for 11 years and been part of a badminton club for three years. Ridden karts countless times, carried out a complete karting training at Carlos Sáinz Karting Madrid aged 16
- **Free time/Holidays:** enjoys literature and cinema
- Passionate traveller, keen to arrange schedules for visiting new destinations and lead fellow travellers through sites
- **Others:** owner of the Driving License and willing to get advantage of diverse opportunities at different places

Gianni ter Haar

+31 (0)630129246 g.ter-haar@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

Postgraduate Motorsport candidate with quality control experience in shock absorbers and work experience in one of the most well-known international damper organisations. Successfully led numerous analysis and electronic design projects. Proactively collaborated in race team delivering winning results in multiple disciplines and always ready to help. Experiences to date enhanced communication and interpersonal skills. Undertook various roles for tennis club; including chairperson and event organiser. Skilled in race car data analysis, electronics and motivating the team.

KEY ACHIEVEMENTS

- Revamped the Quality Control system for better claim tracking, increasing customer satisfaction regarding claim procedures and organised multiple 8D processes to eliminate quality nonconformities
- Created and designed a functional vehicle in a team of 25 following process steps of IPMA-D. Group leader of the chassis/carrosserie development
- Programmed a linear motor to function as a vehicle damper using Arduino and electronics leading and providing guidance to colleagues during multiple phases
- Innovate a sensor system for a vehicle to review vehicle dynamics and suspension performance regarding comfort and handling of a patented new damper design against a competitive design

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, Cranfield, UK (October 2020 - September 2021)

- **Modules:** Motorsport Structural Analysis, Motorsport Electronics and Data Acquisition, Motorsport Vehicle Dynamics, Motorsport Aerodynamics, Computational Fluid Dynamics for Motorsport, Business of Motorsport, Composite Structures for Motorsport and Motorsport Powertrains
- **Group Design Project:** To be determined
- **Thesis**: Will be related to performance engineering or electronics

BSc Automotive Eng.: Rotterdam University of Applied Science, Rotterdam (September 2015 - July 2019)

- **Modules:** Automotive Development, Automotive Quality Management, System Engineering, Advanced Testing & Modelling, Automotive R&D, Business and Organisation, Efficient and Intelligent Engineering, Strategic and Operational Management, Advanced Analysis, Software Development Tools and CAD
- **Group Projects:** Developed a complete vehicle meeting pre-defined requirements in one year with a group, Part of Shell Eco-Marathon Team Phidippides. Responsible for steering development of the Triga II
- **Thesis:** 'FSD Mark 2 Validation Experiment'. Experimental validation of a new version Frequency Selective Damping using objective and subjective data acquisition

CAREER HISTORY

KONI ITT: Oud-Beijerland, NL - Customer Quality Engineer (March 2020 - September 2020)
KONI is the premier manufacturer of performance and adjustable shock absorbers in the world. KONI shocks are made from the highest quality raw materials and machined to the highest tolerances. This quality is represented not only by KONI's long heritage in motorsports but also by the diversity of shock absorber solutions. KONI has taken shock absorber performance and comfort to the next level with patented Frequency Selective Damping Technology

- Coordinated staff to improve quality from internal processes and working discipline resulting in a decrease of 30% of open claims
- Led root cause analysis investigations to determine core reason for failures and errors improving quality awareness and inspection for multiple departments
- Performed quality inspections and drafted reports to detail non-conforming material issues to management and customers resulting in an increase of customer satisfaction
- Maintained process quality by providing guidance to operators in work instructions and protocols reducing amount of quality issues and strengthen positivity

Bas Koeten Racing: Westwoud, NL - Race Car Data Analyst (August 2019 - September 2020)
Race team in multiple disciplines like the Ford Fiesta Sprint cup, TCR, Endurance and Porsche Benelux Supercup

- Investigated and addressed vehicle performance to enhance vehicle knowledge
- Analysed driver performance/Coach driver based on data acquisition enhancing drivers lap times
- Informed team manager and technicians about vehicle issues based on acquired data

KONI ITT: Oud-Beijerland, NL - Machine Operator (October 2019 - March 2020)
To reach the goal of studying overseas, practical machinery knowledge is acquired and salary to pay the course

- Prevented personnel injuries during plant maintenance by practising diligent lockout-tagout processes
- Completed work according to schedule and helped struggling team members
- Operated a variety of assemble machinery, lathe and testing machines safe and correctly to finish production goals

KONI ITT: Oud-Beijerland, NL - R&D Student Employee (February 2018 - July 2019)
Followed the student/employee trajectory during the automotive course doing 4 days project at the organisation and 1 day theoretical lessons

- Investigated possibilities of replacing a hydraulic damper with a linear motor for increasing market
- Programmed a linear motor to function as damper in a damper test machine
- Created a half vehicle model in Matlab/Simulink for future investigations to newly designed dampers
- Advised KONI on damper performance on a new damper design based on theoretical and practical analysis
- Organised an experiment with 30 colleagues to examine damper performance based on objective and subjective data acquisition

AllSecure: Rotterdam, NL - Data Analyst (July 2017 - August 2017)
Insurance company for vehicles claims

- Analysed accidents with respect to Advanced Driver Assistance Systems increasing knowledge of claim occurrence

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Hobbies/Interests:** Played Tennis since 2005 and was part of a selection with higher intensity training (2008-2015), Motorsport, Sim Racing, Engineering, Cars
- **Extracurricular activities:** Chairman Tennis Society Cranfield University (October 2020 - Current), Member Padel commission Tennis club (February 2018 - September 2020), Chairman Youth commission Tennis club (October 2018 - December 2019), Member Youth commission Tennis club (April 2016 - October 2018)
- **Skills:** Racecar Performance Analysis, Quality control, Root cause analysis, Matlab/Simulink, Teamwork

Xavier Valls Santafe

+34 639554982 xavi.valls-santafe@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

An aerospace engineer passionate about developing technological solutions to practical engineering challenges, currently studying a double Master's degree in Aeronautical and Motorsport engineering at Cranfield University. Professional experience in engineering design, management and consultancy with an international career developed through different internships with a Mexican enterprise consultancy, Airbus Germany and a Spanish Urban Air Mobility company. Enthused by motorsport activity with particular focus in the designing process, especially aerodynamics. Fast learner, team worker, ingenious, good communicator and eager to take on challenging projects requiring superior performance. Technical expertise includes: MATLAB, Computer Aided Design (SolidWorks), CFD software (Ansys Fluent), Structural Simulation software (SolidWorks Simulation).

KEY ACHIEVEMENTS

- University Entrance Exams 2015 distinctions from the Catalan government for obtaining an excellent qualification
- Awarded "Ajuts Universitaris" scholarship from "Fundació Catalunya La Pedrera" for academic achievement
- Invited to participate in the "Leading Program Business Experience 2015" from BCNMoments
- Design of ball and hand-held wicker device for the Red Bull Jai Alai Challenge. A project seeking to find aerodynamic and material properties improvements of sport instruments used when practising Jai Alai with the aim of breaking the world record of ball speed, achieved by Iñaki Goikoetxea in November 2020
- INNOGROUND involvement and participation, an innovation competition to generate innovative solutions to real challenges posed by real companies in 24 hours

EDUCATION

Advanced Motorsport Engineering MSc: Cranfield University, Cranfield, UK (October 2020 - Present)

- **Modules:** Induction and Introduction to Motorsport, Motorsport Structural Analysis, Motorsport Electronics and Data Acquisition, Motorsport Vehicle Dynamics, Motorsport Aerodynamics, Computational Fluid Dynamics for Motorsport, The Business of Motorsport, Composite Structures for Motorsport, Motorsport Powertrains.

Aeronautical Engineering MSc: Universitat Politècnica de Catalunya, Terrassa, Spain (September 2019 - Present)

- **Modules:** Aerodynamics, Flight Mechanics, Orbital Mechanics, Aerospace Production and Design, Aerospace Materials, Design and Construction of Airports, Rockets Combustion and Propulsion, Aerospace Vehicles, Radiofrequency and Communication Systems, Computational Engineering, Air Transport and Navigation Systems, Aircraft and Aerospace Vehicles Project Management, Aircraft Propulsion Systems, Fundamentals of Propulsion, Airport Engineering Fundamentals, Fundamentals of Space Engineering.

Aerospace Vehicle Engineering Bachelor's degree: Universitat Politècnica de Catalunya, Terrassa, Spain (September 2015 - June 2019)

- **Modules:** Algebra, Calculus, Physics, Fundamentals of Programming, Graphic Expression, Airspace, Air Navigation and Infrastructure, Chemistry, Further Mathematics, Statistics, Thermodynamics, Aerospace Vehicles, Electrical Circuits, Materials Science, Mechanics, Fluid Mechanics, Propulsion Systems, Aerodynamics, Automatic Control, Electronic Circuits, Mechanical Systems, Structural Theory, Introduction to Sail-planes, Mechanics of Robotic Manipulation, Motorbikes Design and Secrets, Innovation and Creativity: Tools for Engineering, Aeroplane Design, Gas Dynamics and Heat and Mass Transfer, Helicopter and Aircraft Design, Aerospace Structures, Flight Mechanics, Projects, Hydraulic Systems, Manufacturing Technology and Maintenance.
- **Individual Thesis:** 'Study of High-Lift Devices for a STOL Light Aircraft'. Selection, design and integration of most adequate high-lift devices for a STOL light advanced electric aircraft. Obtained mark: 10/10.

CAREER HISTORY

Advanced Air Mobility: Barberà del Vallés, Spain - Aerodynamics and Mechanical Design Engineer (January 2019 - Present)
AAM seeks to find advanced solutions for personal air mobility aiming to redefine a new era of commuting transportation.

- Designed high-lift devices for a STOL operations light advanced electric aircraft
- Conducted the STOL aircraft prototype design (endorsed by CAD, structural and flow simulation analyses), manufacture and testing
- Performed and evaluated structural and aerodynamic design of the one-seat prototype by means of simulation analyses

P3 Engineering GmbH: Airbus Finkenwerder, Germany - Internship (July 2018 - August 2018)
P3 Engineering GmbH is an aerospace Management Consultancy.

- Managed, configured and implemented an ANDON system to notify management, maintenance and other workers of a quality or process problem in the AIRBUS Hamburg plant
- Collaborated with the Non-Conformity department management, in occupational safety at production shop floor department and in Jigs and Tools department

Universidad Aeronáutica en Querétaro (UNAQ): Queretaro, Mexico - Internship in the TPD Area (July 2017 - August 2017)
UNAQ Technological Projects Development (TPD) area carries out technological and engineering projects in alliance with companies in the aeronautical and space sector.

- Managed and provided advice on different projects carried out by the Technological Projects Development (TPD) department through meetings with clients and presentation of solutions
- Collaborated as a consultant in the aerodynamics design of a low-cost sports car

CaixaBank: Barcelona, Spain – Events Coordinator (May 2016 - September 2020)
CaixaBank is a financial group comprised of banking business, insurance activity and investments in international banks and leading companies in the services sector.

- Coordinated, organized and allocated staff for formal events; provided solutions resolving possible conflicts
- Encouraged and motivated guests to understand the different commercial products offered for promotional events
- Managed the events outcomes and timings; advising guests in both conferences and protocol events

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages:** Spanish (Native), Catalan (Native), English (Fluent)
- **IT Skills:** MATLAB, Computer Aided Design (SolidWorks), CFD software (Ansys Fluent, SolidWorks Flow Simulation), Structural Simulation software (SolidWorks Simulation), Image Editor software (GIMP), Animation and Rendering software (3ds Max), AVL Boost, MS Office, C/C++
- **Individual Interests:** Tennis and football player, scuba-diver, true fan of all kinds of Motorsport
- **Professional/Technical training:** Universidad Aeronáutica en Querétaro, Mexico - Composite Materials Techniques (Infusion and Hand Lay-Up). BCN Moments, Barcelona - "Leading Program Business Experience"

Yolandi Watkins

+44 7495 706647 Y.Watkins@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

Masters candidate in Advanced Motorsport Engineering at Cranfield University. Organised, detail orientated and inquisitive student passionate about motorsport and engineering. Work experience acquired in South Africa and England include trackside support, race set-up and manufacturing of Historic Formula Ford and endurance racing vehicles. Previous work experience includes software testing within mobile space, design intern in rally racing team and data analytics in filtration systems. Significant interests in trackside data analysis and aerodynamic design and improvement.

KEY ACHIEVEMENTS

- Gained SolidWorks industry experience and was involved in the design, development and manufacturing processes of rotary mining equipment.
- Wrote Python scripts to process data processing and monitor life cycle of products.
- Became the top test engineer in iOS testing in less than 2 years, evaluating flaws and executing new test methods to enhance product quality.
- Research thesis project investigated flow separation over a rally vehicle. Constructed a scale model and performed various wind tunnel tests. Previous design flaws led to flow separation and driving difficulties at high speed, hence new designs verification was required.

EDUCATION

MSc Advanced Motorsport Engineering Cranfield University, Cranfield, UK (October 2020 - September 2021)

- **Modules:** Motorsport Power Train Design, Motorsport Electronics and Data Acquisition, Business of Motorsport, Motorsport Aerodynamics, Computational Fluid Dynamics for Motorsport, Motorsport Structural Analysis, Composite Structures, Motorsport Vehicle Dynamics.
- **Group Design Project:** Topic TBC.
- **Individual Thesis:** Rear wing vortex manipulation to improve drag.

BSc (Honours) in Mechanical Engineering (2:1): University of the Witwatersrand, Johannesburg, South Africa (February 2011 - December 2017)

- **Modules:** Thermal Systems, Systems Management and Integration, Fluid Dynamics, Mechanics of Solids, Mechatronics, Mathematical Methods, Mechanical Engineering Laboratory, Business Management, Thermodynamics, Mechanical Engineering Design and Production, Numerical Methods and Statistics, Mechanical Vibrations, Mathematics, Applied Mechanics, Computing Skills and Software Development, Mechanical Engineering Design, Physics.
- **Final Research project:** focused on flow separation over top of Century Racing 6 Rally Vehicle with focus on wind tunnel testing of a scale model and proof of concept.
- **Final Design project:** focused on designing a new suspension system to resist longitudinal and lateral roll. The system would be further developed and used for by University in the Solar Car Challenge.

CAREER HISTORY

Enigma Motorsport: Bedfordshire – Volunteer Race Support Engineer (June 2020 – September 2020)
British Formula Ford Trackside Support.

- Received training in race car setup for different experience drivers and set up a British Formula Ford car for a testing day.
- Track side support at race day event at Brand Hatch analysing driver requirements and setting up the car for practice, qualifying and race events.

Glucode: Johannesburg - iOS Test Engineer (September 2018 – September 2020)
Software Development House.

- Managed investigations into improving iOS mobile application automation test coverage.
- Standardised Gherkin practice structures into the core subsection of mobile application proving its value and necessity and led to application wide implementation.
- Taught fellow colleagues in automated testing practices ensuring the new standards were applied.
- Created automated tests for an entire feature within largest South African Health and Vitality Mobile Application to reduce manual testing and increase verification of intricate new features.
- Wrote and maintained tests for every feature within Vitality UK project simultaneously to development work. New features were released with surety of thorough testing.

Century Racing: Johannesburg - Development Engineer (February 2018 - July 2018)
Rally Racing Team.

- Created SolidWorks assembly drawings to improve assembly time and designed small auxiliary parts.
- Updated suspension parts to improve strength and durability due to multiple failures during racing events.
- Managed outsourcing processes for suspension part manufacturing and treatment following design. Inspected each step of the process to ensure assembly started on time.
- Maintained and improved the parts inventory system to eliminate delays in the assembly process and deliver cars to customers on time.

Cummins Filtration: South Africa - Technical Graduate (February 2017 - January 2018)
American multinational corporation that designs, manufactures, and distributes engines, filtration, and power generation products.

- Designed and selected various air filtration parts and systems for mining vehicles in South African open cast mines. This was due to various mining equipment application in varying environments.
- Developed and implemented a tracking system using Python to track air filter restrictions and pre-empt filter changing schedules due to short life span of air filters and minimising down time on mining equipment.
- Wrote weekly technical reports to track filter life and predict longevity of filters. Predictions showed superiority of Cummins Filters compared to rival brands and provided a service beyond comparison.

Osborn Engineered Products: Johannesburg - Student Engineer (June 2014 - January 2016)
Worked at Osborn during academic breaks. Osborn manufactures crushers, feeders and screens and further specialises in crushing and screening plants.

- Received training in SolidWorks and assisted engineers in created manufacturing drawings to produce parts for rotary crushers.
- Generated assembly drawings of mining crushers to aid the production team in assembly.
- Learned about welding techniques and practices of CO2 welding. Implemented these techniques and assisted welders during the manufacturing process.

Bailey Edwards Cars: Johannesburg - Technical Trainee (November 2013 - December 2013)
Building high quality, reliable, usable and fully race-able recreation GT40 replica's.

- Gained practical experience by assisting chief mechanic in repairing race cars as well as building new customer specification race cars. Disassembled a Ford Flat 4 engine to remove pistons for repair.
- Received training and assisted in the layup of fibre-glass body work as well as carbon fibre lay up of an engine air intake manifold.
- Assembled front uprights for a custom-built Ford GT40 and aided the build of the electrical loom. Connected rear brake lights and additional regulatory rear lights.

SKILLS, INTERESTS & EXTRACURRICULAR, ACTIVITIES

- **Technical Skills:** SolidWorks, MatLab, ANSYS, Python, AutoDesk Fusion 360, Proficient in using the MS Office suite (Excel, Word and PowerPoint). Designed several undergraduate projects using AutoDesk Inventor (scissor lift, package wrapping station).
- **Extracurricular:** Competed at district level public speaking competitions during high school, tutored high school students while completing undergraduate degree.
- **Hobbies:** watching Formula series motorsport, participating in local motorsport events as trackside volunteer; keeping up to date with the latest engineering advances in high performance cars, interval training; learning to play the guitar; sour dough baking; photography.

Odin Engineering Press Release – April 2021

For immediate release

30 April 2021 – Milton Keynes, UK

Odin Engineering is delighted to launch a new electric racing car targeting international street racing events. The two-seat open cockpit design makes this vehicle the perfect candidate for potential Formula E support series. In addition, some innovative design ideologies such as 3-motor powertrain configuration and active torque vectoring offer opportunities for drivers to explore the next generation electric racing technology.

To select the proper powertrain used in the car, combinations among 21 kinds of motors 133 types of battery cells are simulated via an HPC-based in-house developed simulator. By comprehensively considering the energy density, track performance, packaging, and cost, the designed all-wheel-drive car has a maximum 360 kW peak power and peak shaft torque of 1881 Nm. With the bespoke controller and BMS design, the 54-kWh battery enables a 30-minute racing[1].

Good vehicle dynamics is crucial in race car design. With a dedicated aerodynamic and suspension setup, the car can provide a predictable behaviour at the limits of the handling. “Odin Engineering provides reachable solutions”. A cost-efficient spaceframe solution with carbon fibre panelling, provides a reliable but straightforward chassis design that enables customer modification and future development.

All in all, this electric racing car design offers an accessible chance of adrenalin filling driving experience.

Odin Engineering will continuously provide sound solutions for electric racing cars that allow motorsport enthusiast to take their driving skills to the next level.

--- ENDS ---

For more information and press, please visit:

www.odin-engineering.co.uk

About Odin Engineering

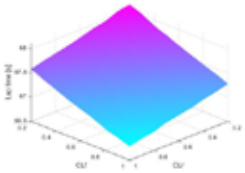
Based in Milton Keynes, UK, Odin Engineering is a specialised electric racing vehicle manufacturer, aiming at the design of agile, high-performance cars. Focusing on racing and our planet, Odin Engineering aims to be a pioneer in sportscars design within the eco-friendly provision.

[1] This data comes from a Simulation result. Different driving style can lead to a different result.

2021 Cranfield Motorsport Group Design project

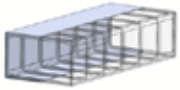
ODIN ENGINEERING

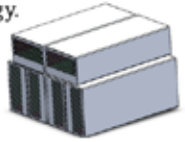
Objectives: Design an electric racing car for a potential Formula E support series. Implement innovative design ideologies such as 3-motor powertrain configuration and active torque vectoring for the development of the next-generation electric racing technology.



Aerodynamics (AE)

High efficiency bodywork (E > 3)
320 kg of downforce @ 200 kph
Extremely low drag
Optimised mass flow for cooling
Lightweight sandwich panels.





Battery (BA)

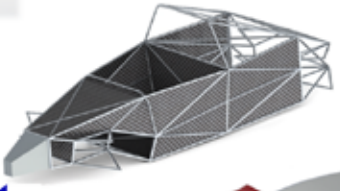
6 modules, 1950 cells of Li-Po battery (Melasta SLPB8363124), 60 kWh, 450 kg (with protection and power electronics). Electrical layout of each battery module is 25S13P.
Active cell balancing BMS.

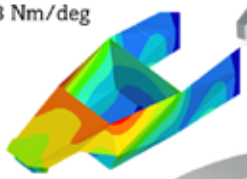
Chassis (CH)

Al 6082 T6 Spaceframe chassis with carbon fibre panelling to increase torsional stiffness and save 16kg

- Torsional stiffness: 10,146.38 Nm/deg
- Mass: 112.79 kg

Survives frontal impact @ 60km/h, < 40g.

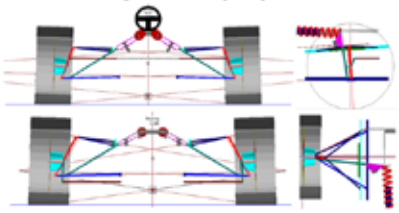




Powertrain (PW)

Peak Power: **360kW**
Peak Torque: **710Nm**
2 Front Equipmake APM120R-550V motors, 1 Rear APM200-600V motor.
P1227 Xtrac differential at rear wheels, with front axle torque vectoring.
Torque-demand motor control with CC/CV regeneration method to regulate battery charging.

Vehicle Dynamics (VD)



Double-wishbone push-rod suspension.

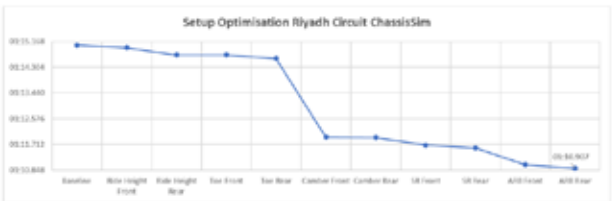
- Optimized chassis mounting points for aero and cooling performance.
- High rear-end mounting points (diffuser performance).
- High tight front-end packaging (airflow for efficiency – cooling).

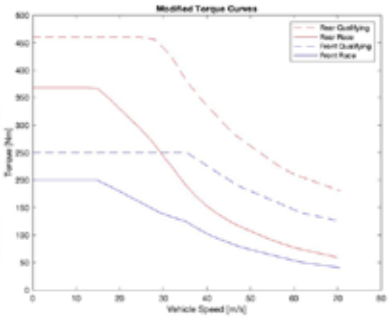
Geometrical Optimization in WinGeo3.

- Maximum roll center lateral and vertical movement: 6,3 mm – 1mm.

Excel Baseline Suspension Setup Tool – Validated with Chassis Sim and Literature.

- Baseline Setup Optimization (Chassis Sim) – 4,31 s lap time gain.





Cooling (CO)

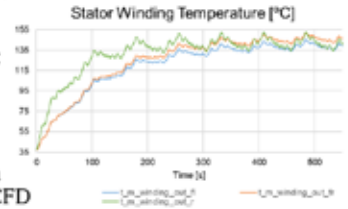
Liquid Cooling (Motor, Inverter)
Active Air Cooling (Battery)

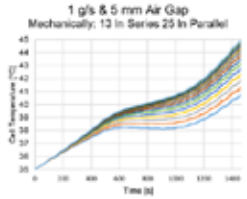
MATLAB-based simulation for:

- Heat Generation
- Temperature Evolution

Validation:

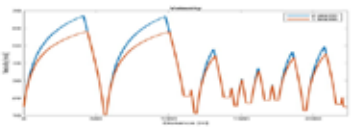
- Manufacturer Radiator Data
- Cell Steady State Thermal CFD

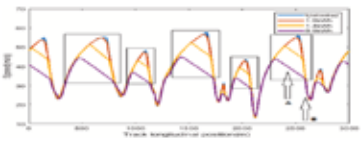




Vehicle Summary:

Riyadh Lap Time: 01:10.907
Max. lateral acceleration: 2.34 g
Vehicle Mass: 1107 kg
Dimensions: 1.91 W x 4.6 L x 1.22 H
Centre of Gravity: 1.493 X – 0.370 Z



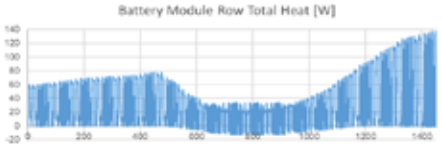


Motor Energy Modes

Race mode (right, above) automates Formula-E "Lift and Coast" (below) by scaling torque in velocity bins to minimise lost lap time and manage energy and thermal requirements.

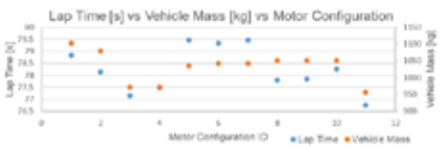
Lap time simulation (LTS)

MATLAB/Simulink Steady-State LTS
MFeval Tyre Model
Bicycle Model Vehicle Dynamics
Electric Powertrain and Battery model
Powertrain Thermal Modelling



Optimisation Loop

A motor and cell selection program was developed, automatically building motor and battery configurations to test using the LTS.



Odin Engineering:

Ajinkya Burande: BA	Iker Raigoso Goitia: LTS, CO, PO, BA	James Montgomery: PO, BA, LTS	Jeff Byloos: VD, LTS
Letian Wang: PW, LTS	Margaux Verza: AE	Pau Anton Malaud I Dos Santos: VD, LTS	Pol Martorell Gil: LTS, AE, PW, BA
Shivansh Agarwal: CH	Tuhin Ali: CH	William Leslie: PW, BA	

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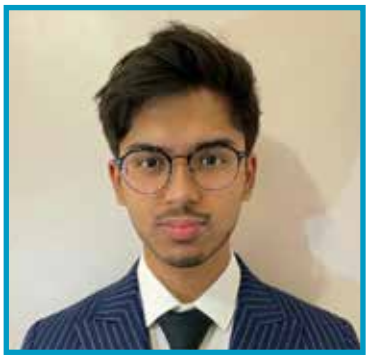
School of Aerospace, Transport, and Manufacturing, Cranfield University

Odin Engineering

Shivansh Agarwal



Tuhin Ali

Ajinkya Burande

Jeff Byloos

William Leslie

Pau-Anton Malaud dos Santos

Odin Engineering

Odin Engineering

Pol Martorell Gil

James Montgomery

Iker Raigoso Goitia

Margaux Verza

Letian Wang

Shivansh Agarwal

+44 7828 106810 shivansh.agarwal@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

Motorsport engineer, seeking to associate with Formula 1 and gaining knowledge and experience in the process. Extremely passionate toward performance machines and motorsports, having the potential to work seamlessly in a team and or embody the ability to lead it. Possess the ability to handle pressure and deliver results. Quick learner, always on the lookout for innovation and excellence taking inspiration from all things fast.

KEY ACHIEVEMENTS

- Founded and headed the Formula Student team during undergrad degree, to take part in Formula Student Hungary, and built from scratch a Formula Student car in 5 months
- Designed and prototyped an electric motorcycle for the Indian market during 3-month internship
- Published a paper in Recent Advancements in Mechanical Engineering and Allied Fields; Research Paper on Anti-lag Turbo system using a CVT
- Published a paper in Recent Advancements in Mechanical Engineering and Allied Fields, Review paper on Valve less engine
- Took part in Formula student design sprint, designing a ‘guesstimate’ F1 power unit using AVL Boost

EDUCATION

MSc: Advanced Motorsport Engineering, Cranfield University, Cranfield, UK (September 2020 - October 2021)

- **Modules include:** Motorsport Structural Analysis, Motorsport Electronics and Data Acquisition, Motorsport Vehicle Dynamics, Motorsport Aerodynamics, Computational Fluid Dynamics for Motorsport, Business of Motorsport, Composite Structures and Motorsport Powertrains.
- Engaged in the Formula 1 Design sprint to simulate a Formula 1 power train in a span of 6 weeks utilizing AVL Boost.
- Utilized Pi toolbox for Analysis of test data, during hands-on practicals for Motorsport Electronics and Data Acquisition.

BE Mechanical Engineering: Sir M.Visvesvaraya Institute of Technology (VTU), Bangalore, Karnataka (September 2014 - June 2018)

- Took up responsibilities for CAD, suspension dynamics, Wheel packaging, Manufacturing of bespoke CNC parts. Used Simscale for analysis of aerodynamics.
- Custom built a "Chopper" type motorcycle as a leader of a 10 man team and stood 5th in National Level Motorcycle design competition.
- Presented a paper on the Aerodynamic modelling and transient flow trajectories on a Racecar.
- Final year thesis - Included turbo-charging of a 4 stroke 250cc engine with a pre-turbo - methanol injection to eliminate need for an Intercooler. Carried out in-cylinder CFD simulation to investigate flow and combustion as a part of a 4-person group project.

CAREER HISTORY

Krot Customs: Bangalore, Karnataka - Operations Engineer (August 2019 - February 2020)
we build bespoke machines at our workshops in Bengaluru, India so our customers can enjoy riding an exceptional authentic vehicle custom built to their needs.

- Conceptualized of target product by rendering various design iterations to match customer needs using CAD
- Including responsibilities of handling operations to deliver each project within a time constraint of 4 weeks
- Created custom aesthetic and performance-based engineered upgrades and services to improve the performance by at-least 12% utilizing custom air intakes and exhaust tuning
- Headed manufacturing-based operations, to ensure timely delivery of finished product

Matter Motor Works: Ahmedabad, Gujrat - Design & Prototyping Engineer (April 2019 - July 2019)
Matter Motor Works made its foray into the new-age mobility market. Leveraging new energy, revolutionary technology, superior infrastructure, and a talented team, Matter Motor Works is changing mobility as you know it

- Interned to gain extensive knowledge about rapid prototyping and its application in electric automotive industry
- Developed an understanding of SLA, FDM and large format 3D printers utilized to manufacture prototype models of the body parts for an automotive leveraged to further model Facia of the LCV during the 3 months
- Accomplished prototyping of an electric motorcycle, using a stock IC engine motorcycle and converted it to run on an electric motor in a short span of 4 weeks
- Manufactured battery packs in-house for the prototype to achieve custom 42 volt requirements

Shiretechnik Solutions Pvt Ltd: Bengaluru, Karnataka - Design, Structural and CFD Intern (August 2018 - January 2019)
Shiretechnik is an engineering design analysis firm uniquely positioned to provide clients with superior results. Our experienced personnel, abundant resources, and state-of-the-art engineering analysis tools, labs and equipment with a focus on clients' demands help us to achieve a unique place in the dynamic market that exists today.

- Designed mechanical components and structures such as intake manifolds and turbine blades for clients employing CAESES to create an optimized design structure allowing for increased performance and reduced mass by 10%
- Utilised TCFD to analyse blade designs for cooling leading to a more optimum design solution for the client thereby increasing the cooling of HVAC system by 17%

Caterpillar India Pvt Ltd: Hosur, Tamil Nadu - Intern Trainee (July 2018 - August 2018)
Caterpillar is the world’s leading manufacturer of construction and mining equipment, diesel and natural gas engines, industrial gas turbines, and diesel-electric locomotives

- Experienced Supply chain management and participated in the task of failure mode analysis during testing of Engines at an In-house testing facility to reduce rework costs using Excel
- Procured mathematical tools and macros to confirm faulty-part and thereby reduce rework during testing
- Learned about various operations and dynamics of a high-capacity manufacturing industry and the basics of working efficiently in an industrial environment over the course of 1 month
- Created a custom assembly process chart for assembly crew to optimise time of assembly by 30%

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Software skill -** SolidWorks (3D CAD and CFD Flow Simulation) CSWA Certified, Autodesk Fusion 360, AutoCAD 2D, Simscale (CFD, Thermal and Structural), ANSYS Workbench (Structural, Thermal and Modal Analysis) Complete Windows Office Suite, Beginner on TCFD simulation software and CAESES for Design Optimization, AVL Boost, Pi toolbox,
- **Language Skills-** Fluent in English, German, Hindi and Kannada
- **Volunteer Work -** as an English teacher at U&I, NGO to teach Underprivileged children in India.

Tuhin Ali

+44 7454389009 tuhin.ali@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

Currently studying for a master's at Cranfield University. An MSc in Advanced Motorsport Engineering. Experience in the motorsport industry as a mechanical engineer due to participating in Formula Student. Actively engaged in motorsport sector through attendance of races and participating in testing and simulations. Previous academics and work experience have developed leadership and team working qualities, particularly as a project leader in undergraduate studies.

KEY ACHIEVEMENTS

- Designed and developed the exhaust system for the De Montfort University Formula Student team for the 2020 car. Achieving 14th position in the UK standings with a budget of £30000
- Manufactured the most powerful Formula Student car thus far for the university working as a team and finding areas where performance could be improved
- Elected Head boy of secondary school by students and teachers. A notable achievement was RAG (raising and giving) week where activities were scheduled for other students to take part in. Raised £850 to hold a Christmas meal for the elderly from local care home
- Attained a First-Class degree in undergraduate studies

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, Cranfield, UK (October 2020 - September 2021)

- **Modules**: Composite Structures for Motorsport, Computational Fluid Dynamics for Motorsport, Motorsport Aerodynamics, Motorsport Electronics and Data Acquisition, Motorsport Powertrain Design, Motorsport Structural Analysis, Motorsport Vehicle Dynamics, The Business of Motorsport
- **Group Design Project**: To design an electric racing car to be used in support races for Formula E. My current focus lies in developing the chassis for the car, specifically in ways to reduce the weight as the battery packs and motors will add a sizeable amount of weight

BA (Hons) Mechanical Engineering (First 82%): De Montfort University, UK (October 2017 - June 2020)

- **Modules**: Principle of Design and Manufacture(75%), Mechanical Principles(70%), Engineering Mathematics(75%), Electrical & Electronic Principles(67%), CAE & Programming(80%), Theory of Machines and Thermodynamics(79%), Strength of Materials(81%), Project Management(82%), Product Design and Development(75%), Advanced Engineering Mathematics(87%), Solid Mechanics(85%), Plant Analysis and Sustainability(81%), Dynamics and Control(84%), Individual Project(81%)
- **Group Projects:** Down-Hill Racer, Structural Straw Bridge, Zip-Line Egg Collector, Diabetes Medicine Cooler(Keep insulin cool while travelling) and Engineering for People Design Challenge(A solution for water shortage was proposed for Tamil Nadu, India).

CAREER HISTORY

DMU Formula Student Team: Leicester, UK – Exhaust Engineer (September 2017 – August 2020)
The Formula Student Team of De Montfort University was established in 2011. The highest finish for the team is 23rd in world rankings.

- Designed and developed the exhaust system using CREO Parametric and analysed using Ansys Fluent. Reduced overall weight of the exhaust system by 40% and improved the performance.
- Involved in the Formula Student Team from the start of university until the end. Started with smaller jobs of fitting parts on the car such as replacing brake callipers and pads, changing wheels and sidepods and various other jobs.
- Advanced to fabricating smaller components such as the flappy paddles. Tested the car on test days for example taking tyre temperatures and brake temperatures.

Castle Cuisine: Newark-on-Trent, UK - Waiter (January 2014 - August 2017)
It is a restaurant which was established in 2008. They specialise in serving Indian food. It was a part-time job during the weekend. It helped to gain valuable experience as a person.

- Confidence grew due to interacting with customers and colleagues. The job also showed how to work as a team on a professional basis rather than at school
- Responsibilities included managing bookings and seating arrangements to ensuring the maximum capacity of the restaurant was utilised
- Managed the staff roles after a year. Appropriate roles were given with people's strengths in mind, so the restaurant operated efficiently.

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Technical Skills:** PTC Creo, Microsoft Office, MATLAB, SolidWorks, Ansys, Abaqus, AVL Boost, CATIA and HyperMesh
- **Machining Skills:** Lathe work, welding, brazing and various other workshop machining techniques
- **Sports:** Team sports such as playing cricket and football where working as a team was crucial to winning the game
- **Extra-Curricular:** Elected head boy. Communicating with pupils, teachers, parents as well as the community was vital as it was the job to represent the student's voice. This involved attending meetings regularly with school leaders.
- **Motorsports:** Enjoy watching and being involved in various motorsports such as Formula One, Le Man but also other sports such as Football (an avid fan of Arsenal F.C) and cricket too. Attended various sporting events such as races and football matches
- **Interests:** Reading is a hobby that was picked up which started from reading the Harry Potter books. This slowly expanded. In general learning about different aspects of the world such as a new system being developed in Formula One(DAS) or even a scientific discovery. Occasionally play video games such as F1, Grand Turismo or even FIFA
- **Memberships:** Graduate member of Institute of Mechanical Engineers

Ajinkya Burande

+91-7066312998 ajinkya.burande@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

An Engineering Graduate with research experience in design and development of automotive engines in leading automotive R&D organization of India. Passionate about motorsport, currently completing an MSc in Motorsport Mechatronics to advance knowledge. Previous membership of formula student team during undergraduate programme has developed experience in designing and fabricating a vehicle. Professional experiences are focused in areas of design and production engineering. Professionally, always worked as part of team, resulting in a team player attitude. Self-driven, creative, and progressive, always up for new challenges to grow horizon. Combination of professional and academic experiences has developed communicative, interpersonal and managerial skills

KEY ACHIEVEMENTS

- 1st Runner-up in Skid-pad Event in the SAEINDIA Formula Student Competition in 2018-Delhi, India
- 6th rank in Designed Event out of 100 teams in the Formula Bharat 2018-Coimbatore, India
- All India Ranking 8th at the National level SAEINDIA Formula Student Competition 2017-Delhi, India
- 1st runner-up in Design and CAE event at SAEINDIA Formula Student Competition 2017-Delhi, India
- Selected to deliver a lecture at University on automotive technologies based on advanced knowledge from current projects
- Managed sponsorship department for annual cultural fest at college, leading team to generate Rs.300K amount

EDUCATION

MSc Advanced Motorsports Mechatronics: Cranfield University, Cranfield, UK (October 2020 - September 2021)

- **Modules**: Motorsport Electronics and Data Acquisition, Motorsport Vehicle Dynamics, Vehicle Control Applications, The Business of Motorsport, Motorsport Powertrains, Mechatronics Modelling for Vehicle Systems, Advanced Control and Optimization, Embedded Vehicle Control Systems
- **Group Design Project**: TBC
- **Individual Thesis**: TBC

Bachelor of Engineering (Mechanical): Savitribai Phule Pune University, Pune (August 2014 - July 2018)

- **Modules**: Applied thermodynamics, Heat and mass transfer, Refrigeration and air conditioning, Applied fluid mechanics, Metallurgy, Vibration and Control, Power plant engineering, Advanced Mathematics, Mechanical engineering design, Mechanics of machines, Theory of Machines, Material Science, CAD Modeling.
- **Group Design Project**: Design and Developed an air intake system. The work was focused on optimizing the geometry of an intake system in automotive sector to decrease the pressure drop and enhance the filter utilization area by adding guide vane for the FSAE race car of the KTM duke 390cc engine. Since the maximum mass flow rate is now a fixed parameter of the restrictor, the aim is to allow the engine to attain the maximum mass flow with minimal pull from the engine to increase the performance. In this design different parts of air intake system such as restrictor, reservoir, runner length and made analysis on design. The manufacturing of the Air Intake is done by 3-D printing process with lamination of FRP.

CAREER HISTORY

Work Experience: Automotive Research Association of India: Pune, India - Research Engineer (September 2018 - July 2020)

ARAI established in 1966, is the leading automotive R&D organization of the country set up by the Automotive Industry with the Government of India. ARAI is an autonomous body affiliated to the Ministry of Heavy Industries and Public Enterprises, and is a prime Testing and Certification Agency notified by Government of India.

- Developed Automotive Engine as research engineer worked on the reduction engine raw emission by working on the engine combustion modelling for BSVI (based on EURO VI emission norms) emission norms.
- Developed heavy duty vehicle engine by carrying out repeated test on the transient dyno-meter by performing various transient engine calibration, to improve on-road engine performance by 10%.
- Diagnosed, Researched and Analysed data of engine emission for selection of “After-treatment catalytic converter” to reduce emission of heavy-duty vehicle engine by 40% to pass BSVI emission norms
- Experienced in Onboard Diagnostic (OBD) calibration of automotive engine as per norms of BSVI emission norms (based on EURO VI emission norms) to accomplish driveability of automotive engine

Formula Student Experience: The Metal Falcon: Pune, India. - Design Engineer (August 2016 - July 2018)

The Metal Falcons began as a student initiative in 2014 by 9 engineering students who shared the passion for engineering, and the determination to make the formula student vehicle of Pune University.

- Headed two department of team, Power-train and Brakes department
- Designed, developed, and fabricated a whole customized braking system. Accomplished a self-designed and in-house fabricated brake caliper and brake master cylinder cutting down weight of the system by 40%
- Increased KTM 390 engine power output by constructing an air intake system for formula student vehicle for performance purpose with validation on chassis dynamometer
- Established 100% inhouse composite material moulded air-intake
- Produced cost report (i.e. total costing of vehicle) to present it in cost event for 2017 -18 season

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages:** Fluent English, German (A1)
- **IT Skills**: IT user. Proficient with Microsoft Word, Excel, PowerPoint, and Project Knowledge of CATIA, SOILDWORKS, Engine Calibration tools and MATLAB/Simulink
- **Individual Interests**: Reading history books, site-seeing and sports
- **Volunteering**: Event Staff for Formula Bharat: Formula student Competition, India
- **Professional/Technical training**: ECU TUNING curated by Competences Factory and Torque Automotive Solution at Bangalore

Jeff Byloos

+44 (0) 77092 08986 j.byloos@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

An experienced professional in developing and preparing race cars with an international mindset. Passionate about all areas of business, engineering and motorsport through involvement in circuit racing, car development and classic restoration. Currently studying an MSc in Advanced Motorsport Engineering at Cranfield University. Creative, innovative, and capable of taking on an individual research project or overseeing a team project from concept to completion, from bare chassis to a winning race car. Previous automotive engineering course, track side experience and engineering internships have enabled the development of outstanding communication, engineering and problems solving skills with fluency in English and Dutch.

KEY ACHIEVEMENTS

- Recognised for meeting and exceeding performance expectations during previous 7-month race engineering internship. Commended by company director for showing initiative, hard work ethics and ability to quickly understand practical skills and advanced theoretical theories
- Awarded recognition for concluding major individual BA thesis project and moving internationally to improve communication skills during COVID-19. Showed initiative to adapt thesis project due to COVID-19 restrictions
- Implemented technical skill under stressful conditions; race car went into the barrier during qualifying; through fast problem solving and leading a strong team with good communication the car was ready for the race four hours later
- Led team with exceptional team work and coordination to build sport prototype race car from bare chassis into front qualifying race car in five days
- Completed full restoration project of a classic alfa Romeo Alfetta GT group 2 FIA race car, whereafter went circuit racing in the UK

CAREER HISTORY

Nielsen Racing Ltd: - Data Engineer part-time, UK (April 2021- present)

Nielsen Racing is an endurance racing team based in the UK who have several LMP3 cars, they take parts in the ELMS, MLMC and the ALMS. They are a successful team who recently won the Asian Le Mans Series during the beginning of 2021.

- Travel to events during the 2021 season for the ELMS and MLMC, the first event at Barcelona was recently completed.
- Take control of the vital signs to make sure the car is running well and does not have any problems; look at driver analysis and video alongside the race engineer. Wintax4 is used for all the data analysis.

Virtuosi Racing: - Engineering Intern, UK (March 2021 – present)

Virtuosi Racing is a successful formula 2 team based in the UK, they set results year after year and won the first feature race in Bahrain this season.

- Working on several projects within the team and also preparing thesis which will be completed at the team, the subject will be around the cause of change in balance characteristic on a formula 2 car assisted by automated data analysis.

Vision Motorsport Engineering Ltd: - Engineering Intern: Evesham, UK (January 2020 - August 2020)

Vision Motorsport is an engineering company based in the West-Midlands, the company is split up into two sister companies. Where one is responsible for designing motorsport set-up equipment and flight cases that are supplied to race teams, the second company is responsible for designing, optimizing and running sport prototype race cars and a classic le Mans race car.

- Oversaw building process and development of two sport prototype race cars; ran at several race weekends and testing days during 2020

- Led building race cars from bare chassis to outstanding car and designing new wings and splitters for testing was part of it
- Analysed technical data and driver feedback from test days and race weekends to develop suspension set-up and enhance driver performance, led to outstanding results
- Oversaw restoration of a Lola T292 Le Mans winning race car for preparation ahead of 2021 classic racing season
- Completed Individual BA thesis at vision motorsport with outstanding remarks, a practical sport prototype race car was implemented into a virtual racing platform and comparison of virtual testing to practical testing was near to exact

LMB Classic Car Workshop: - Mechanical Engineering part-time: Wommelgem, Belgium – Junior Mechanical Engineer (January 2018 - December 2019)

LMB is a classic car workshop, specialises in pre-65 cars including pre-war. Focus is laid on restoring and maintaining high-end classic cars and race cars while also providing assistance at rallies including The Mille Miglia.

- Solving mechanical problems and fine-tuning classic cars, worked on well over forty cars during part time working at LMB
- Gained a great deal of mechanical experience, allowing a full understanding of a car mechanically and processing the ability to completely restore a car with experience in a dozen cars and further develop engineering skills

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, Cranfield, UK (October 2020 - September 2021)

- **Individual Thesis:** The individual thesis will be completed at Virtuosi Racing around driver and chassis analysis in correlation with automated data analysis, a relevant subject to the current race engineering.
- **Group Design Project:** Conceptual design of an electric sportscar for formula E support events. Involved as vehicle dynamics engineer designing complete suspension system and tyres: Suspension modelling in Wingeo3 and Lotus Shark and using chassis sim to develop the overall vehicle design on a relevant street circuit.
- **Modules:** Motorsport vehicle dynamics, Motorsport powertrain design, The business of motorsport, Motorsport electronics and data acquisition, Motorsport aerodynamics, Computational fluid dynamics for motorsport, Composite structures for motorsport, Motorsport structural analysis.

BA (Hons) Automotive technology: Thomas More, Belgium (January 2018 - June 2020)

- **Individual Thesis:** Improving lap time performance through virtual simulation and suspension set-up optimization on a sport prototype: project aims to implement a practical car into a virtual simulation platform and to compare virtual testing to practical testing.
- **Modules:** Motorsport Powertrains, Vehicle dynamics, Internal Combustion engines, Motor management, Hybrid- and Electric systems, Automotive Electronics, Alternative Fuel systems, Thermodynamic processes, Vehicle Networks, Automotive Management, Automotive Simulation and Testing, Drive Trains.

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages:** Fluent English and Dutch.
- **IT Skills:** Prominent IT user. Experience in MATLAB, Wintax4 pro, RS3, PI Toolbox, AVL Boost, Susprog3D, Chassissim, Excel VBA, Word, PowerPoint and knowledge of driving simulator programs
- **Individual Interests:** Active member of BARC, CTCRC and HRDC, racing a classic car and keen skier. Enjoys working on classic cars and cycling. A profound interest in business development and economics.
- **Professional/Technical training:** IELTS Certificate

William Leslie

+44 (0)7763225391 william.leslie@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

A conscientious, diligent individual with a versatile mindset, that applies these values in the professional environment. Ability to effectively provide solutions in critical or pressurised situations, developed through experience in industry and academic settings. Observation and liaising in these environments have enabled the augmentation of adept communication skills. In turn, these attributes amalgamated together have provided the formation of a positive, leadership mentality.

KEY ACHIEVEMENTS

- Partook in a project, as part of a team, that was tasked with the design of a production motorcycle that consequently received multiple industry design awards.
- Through voluntary work, assisted with project management and electrical engineering tasks at airports such as RAF Brize Norton and Seletar airport, Singapore.
- Assisted in various tasks at a manufacturer of hydraulic access platforms. These tasks involved various disciplines of engineering such as production, electrical, computer aided design and mechanical. Shadowed operation managers and spent time completing tasks for production management that included production efficiency.
- Designed and self-manufactured a compact, folding electric guitar, consequently earning the highest marks and grade (A*) within the entire Design and Technology cohort.

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, Cranfield, UK (October 2020 – September 2021)

- **Modules:** Motorsport Powertrains, Motorsport Electronics and Data Acquisition, The Business of Motorsport, Motorsport Aerodynamics, Computational Fluid Dynamics for Motorsport, Motorsport Structural Analysis, Composite Structures for Motorsport, Motorsport Vehicle Dynamics.
- **Group Project:** Conceptual design of an electric sports car for Formula E support events.
- **Individual Thesis:** TBC

BEng (Hons) Aerospace Engineering (1:1): Swansea University, Swansea, UK (September 2016 - June 2020)

- **Modules**: Fluid mechanics, strength of materials, thermodynamics, engineering mechanics, engineering analysis, structural mechanics, control systems, computer aided engineering, aerodynamics, airframe structures, aerospace systems, flight mechanics, gas dynamics, propulsion.
- **Individual Dissertation:** ‘Enhancing the aerodynamic performance of a Formula Student car through computational fluid dynamics’.

Certificate in finance, accounting and business: Institute of chartered accountants in England and Wales (September 2017 – September 2018)

- **Modules:** Business and finance, management information, Law, assurance, principles of tax and accounting.

CAREER HISTORY

Institute of Chartered Accountants in England and Wales – Administrative support (August 2017) The Institute of Chartered Accountants in England and Wales (ICAEW) was established by royal charter in 1880. It has over 147,000 members. Over 15,000 of these members live and work outside the UK.

- Provided administration support to senior assessment executives, to aid with coordination and management.
- Data entry that included data ingestion of various types of sources, common data cleansing and transformation. This role also encompassed quality assurance to ensure that the data validation practices were upheld.
- Performed analysis and troubleshoot issues of online databases, as well as the initial setup of database structures and permissions. This also included involvement with the continuous monitoring of the backup functionality of the database.

Triumph Designs Limited – Student Design Engineer (July 2018 – September 2019)

Triumph Motorcycles Ltd is the largest UK-owned motorcycle manufacturer, established in 1983. It has over 2,000 employees spread across 5 factories based in the UK, Thailand, India and Brazil.

- Provided design support to a team of senior engineers, to aid with the design of a mass-produced motorcycle.
- Designed and developed components from concept through to detailed design and production drawings. This included liaising with potential suppliers across the globe and presenting design proposals to Chief Engineers.
- Performed testing of prototype and production parts both on-site and at various testing facilities. This testing also included writing detailed reports in order to sign off each tested part.

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **IT Skills**: Confident IT user, with a high level of proficiency in the use of Microsoft Word, Excel and PowerPoint. Also, competent with computer aided design software; Solidworks and Creo Parametric, the programming language; Matlab and the computational fluid dynamics software, Ansys Fluent.
- **Individual Interests**: keen motorcycle enthusiast which has led me to undergo full mechanical and visual restoration projects on classic Japanese motorcycles. Additionally, provided mechanical support to aid in the maintenance and preservation of private collection of military vehicles (A and B types).
- **Volunteering:** Engaged in several voluntary projects with a company named Megadoor, that manufacture and implement large-scale commercial doors for aircraft hangars. This involved shadowing a project manager and producing creative solutions to on-site problems faced by the engineers, both from an electrical engineering and project management perspective. This involved projects at both Changi International airport (June 2013), Seletar airport (June 2013) and RAF Brize Norton (April 2014).
- **Memberships:** Member of the Royal Aeronautical Society (RAeS), Aerospace Society, Institution of Mechanical Engineers (IMechE) and the Aircraft Owners and Pilots association (AOPA), Vintage Japanese motorcycle club (VJMC).

Pau Anton Malaud dos Santos

+34 684025647 pau-anton.malaud-dos-santos@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

A Mechanical Engineering graduate and Motorsport Engineering student passionate about Motor Sport and Race Engineering. Possesses strong organisational skills, a technical background and encourages teamwork to enhance performance. Eager to take on superior performance challenges. Experienced in multiple formula related projects during academics including Formula SAE. Comfortable under pressure and devoted to reaching set goals. Writes and speaks native Catalan and Spanish, mother tongue English and French and can communicate in Portuguese. Compleat in multicultural and international environments.

KEY ACHIEVEMENTS

- Achieved Grade A in Individual Bachelor Thesis as part of a Formula Student team collaborating on a new area of design in first year as a team member
- Achieved Grade A+ in Final Research Project at Secondary School studying Aerodynamics, Hydrodynamics and Biomechanics in Triathlon
- Attained Spanish Alpine Ski Instructor Diploma (Spanish Levels I and II of III)

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, Cranfield, UK (September 2020 - Present)

- **Modules:** Composite structures for motorsport, Computational fluid dynamics for motorsport, Motorsport aerodynamics, Motorsport electronics and data acquisition, Motorsport powertrain design, Motorsport structural analysis, Motorsport vehicle dynamics, The business of motorsport.
- **Group Design Project:** to be determined.
- **Individual Thesis:** to be determined.
- **Voluntary Project:** Formula One Powertrain Design sprint.

BSc Mechanical Engineering (Exchange): Polytechnique Montréal, Montréal, Canada (August 2019 - May 2020)

- **Individual Thesis:** Thermomechanical Analysis of a Formula FSAE Brake Disc and data correlation.
- **Modules:** Thermal Engineering, Production Organisation.

BSc Mechanical Engineering: Universitat Politècnica de Catalunya, Barcelona, Spain (September 2016 - June 2019)

- **Modules:** Numerical Methods in Mechanical Engineering, Fluid Engineering, Machine Design, Thermodynamics and Heat Transfer, Engineering Design, Materials Science and Technology, Strength of Materials, Mechanical Design, Kinematics and Dynamics of Machines, Mechanical Systems, Fluid Mechanics.

CAREER HISTORY

Argenti Motorsport: Banbury, England - British F4 Data Engineer (February 2021 - Present)
British Racing team operating across both British Formula 4 and a global karting programme.

- Provided support in pre-season testing for British Formula 4 as trackside engineer. Surveying and diagnosing engine health, car reliability, sensor verification and calibration
- Operated data, video acquisition and data comparison for 3 cars supporting Race Engineer using LifeRacing. Producing tyre and engine mileage reports and driver reports focusing on driver performance.

Formula Student Polytechnique Montréal: Montréal, Canada - Individual Bachelor Thesis (August 2019 - June 2020)
FSAE Polytechnique Montréal is a student team that has been designing and manufacturing Formula SAE single-seaters for thirty years. In 2019 the team achieved a 7th place at FSAE Michigan and at Formula North and a 1st place at FSAE Lincoln.

- Created a thermo-mechanic tool to analyse disc brake behaviour through numerical simulation and data correlation to establish future disc brake design process. Led development in new area of design in first year as team member
- Presented a report with simulation structure and details, data correlation, design analysis, result validation and conclusions. Results precision was within 90-95% respective to experimental data

Formula Student Polytechnique Montréal: Montréal, Canada - Junior Member (August 2019 - June 2020)
Formula Student team participating in SAE international competitions.

- Engaged in chassis manufacturing and assembly. Elaborated carbon fibre and kevlar floor panel through resin infusion. Prepared and polished resin aero-moulds to ensure smoothness and accuracy of glass fibre moulds
- Collaborated in design assessment, weekly design reviews, testing and race events

Consorci d'Educació de Barcelona: Barcelona, Spain - Oral English Teacher (October 2017 - June 2019)
Educational Committee that manages public education in Barcelona. Participated in an educational pilot programme to improve english level in public schools.

- Guided ten secondary school students as an oral english teacher and analysed individual student progress. Managed to improve oral english skills, public speaking skills and overall english level
- Built lesson plan and managed monthly planning. Coordinated communication and feedback with school director
- Co-authored overall programme feedback trough an interview published in an educational magazine, 'Diari Educació'

SnowPlay S.L.: Artiés, Spain - Ski Instructor (December 2018 - April 2019)
Exclusive ski school specialized in private lessons and small groups.

- Directed private and group ski lessons with beginners, intermediate and advanced skiers. Executed group lessons in an international environment

Intercerdanya S.L.: Llívia, Spain - Ski Instructor (December 2014 - April 2016)
Company specialized in organizing winter sports events and lessons.

- Took part in organizing a skiing race. Led private and group ski lessons in an international environment

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Hobbies:** Motorsports, sports, sport cars and travel
- **Languages:** Proficient English, French, Spanish and Catalan. Can communicate in Portuguese
- **IT Skills:** Experienced with Life Racing Solidworks, Ansys, Microsoft Word, Excel and PowerPoint, and knowledge of Matlab, Python, Catia and AiM Race Studio
- **Sports:** Competed in alpine skiing, football and triathlon. Practice mountain biking, road cycling, bouldering, skiing and surfing

Pol Martorell Gil

+44 7709 261714 pol.martorell.gil@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

An Aerospace Vehicle Engineer pursuing a double MSc programme in Aeronautical and Advanced Motorsport Engineering. 18 months of experience as Aerodynamics and Mechanical Design Engineer at Trencalòs Team (equivalent of Formula Student focused on the design of an electric aircraft). Safety Scrutineer, Flag Marshal and Volunteer Coordinator at Formula Student Spain, Scrutineer and Timekeeper Trainee by Motorsport UK. 4 years of experience as a basketball coach to pursue my second passion (sports), with focus on promoting teamwork and improving communication skills. Former member of the European Youth Parliament. Lived in Beijing, China, for over 6 months to undertake the final thesis on the aerodynamic design of a business jet.

KEY ACHIEVEMENTS

- Graduated with honors in Project Management (91%), top 10% in Aerospace Vehicles (96%) and Computational Engineering (91%), with grades over 90% in Propulsion Systems (92%) and Design and Construction of Airports (91%) (MSc Aeronautical Engineering, 2020).
- Awarded "*Programa Yuzz. Jóvenes con Ideas*." for Sports Stock Exchange (SSE), an entrepreneurial project that tries to develop an idea of business related to sport and finance by creating a multilateral platform that brings together athletes and investors analogously to the stock market (2018).
- Led school debate team to national and international phases of the European Youth Parliament (2012-2015).
- Class President at High School, 2013-2014.

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, Cranfield, UK (Sept 2020 - Present)

- **Modules** (Overall GPA: -%): Induction and Introduction to Motorsport, Motorsport Structural Analysis, Motorsport Electronics and Data Acquisition, Motorsport Vehicle Dynamics, Motorsport Aerodynamics, Computational Fluid Dynamics for Motorsport, The Business of Motorsport, Composite Structures for Motorsport, Motorsport Powertrains.
- **Group Design Project** (-%): Design of an electric open-cockpit sports-car for a potential Formula E support series. Head of Aerodynamic Design and Vehicle Simulation Engineer.
- **Individual thesis** (-%): TBC.
- **Side Projects**: F1 Design Sprint.

MSc Aeronautical Engineering: ESEIAAT (UPC), Terrassa, Spain (Sept 2019 - Present)

- **Key Modules** (Overall GPA: 83%): Aerodynamics, Aerospace Vehicles, Flight Mechanics and Orbital Mechanics, Fundamentals of Space Engineering, Aerospace Materials, Computational Engineering, Propulsion Systems, Project Management, Air Transport and Navigation Systems, Rockets Combustion and Propulsion, Airport Design and Construction, Airport Engineering Fundamentals.

BSc Aerospace Vehicle Engineering: ESEIAAT (UPC), Terrassa, Spain (Sept 2015 - July 2019)

- **Key Modules**: Aerodynamics, Aerospace Vehicles, Helicopter and Aircraft Design, Airplane Design, Flight Mechanics, Aircraft Systems and Instruments, Introduction to Rockets, Fluid Mechanics, Application of Open-Source CFD to Engineering Problems, Gas Dynamics and Heat and Mass Transfer, Propulsion Systems, Mechanics, Aerospace Structures, Materials Science, Project Management, Business, Motorbikes Design and Secrets, Plug-In Hybrid Electric Vehicles: Concept, Design and Project of Electric Propulsion Systems, Mechanical Systems, Thermodynamics, Chemistry, Hydraulic Systems, Mechanics of Robotic Manipulation, Fundamentals of Programming, Graphic Expression, Statistics, Physics, Calculus and Algebra.
- **Individual thesis**: Wing Layout Design and Airfoil Selection for a Transonic Business Jet.
- **Side projects**: Trencalòs Team (Aerodynamics and Mechanical Design Engineer), Formula Student Spain (Volunteer Coordinator, Safety Scrutineer and Flag Marshall).

Exchange Programme: BEIHANG University, Beijing, China (Spring 2019)

- 6 months exchange programme at BEIHANG University, in Beijing. Conducted final thesis focusing on Aerodynamic Design of a transonic business jet using CFD.
- Engaged with local culture and learned basic language skills in Chinese.

CAREER HISTORY

Trencalòs Team: Terrasa, Spain – Aerodynamics and Mechanical Design Engineer (Sept 2017 - Feb 2019)
Student led project (equivalent to Formula Student) focused on the Air Cargo Challenge, an aeronautical engineering competition that is held in Europe every two years.

- Main focus on the aerodynamic design of the 2019 ACC contender. Used MATLAB to develop an optimisation tool that integrated the open-source code *TORNADO*.
- Restored previous ACC contenders – Aerodynamic and Mechanical improvement of several parts to use as a trainer for the pilot.
- Completed several side projects, including the structural and aerodynamic design of remote-control aircraft parts and software development and integration using MATLAB for the optimisation of the aircraft's design.
- Organised cultural and technological activities at the University campus of Terrassa including the Paper Air Challenge, an aeronautical competition that rewards the best overall design of a glider according to weight and cost regulations.

Institució Cultural del CIC: Barcelona, Spain - Basketball Coach (Sept 2016 - July 2020)
Private foundation created in 1984. Aims to teach any subject and degree and cultural, educational, and formative activities in general.

- Coached children aged from 6 to 14 years old both in scholar and federated leagues.
- Developed great communication skills oriented to players, colleagues, and superiors.

European Youth Parliament: Barcelona, Spain - Member (Sept 2012 - July 2015)
Politically unbound non-profit organisation that supports the developments of young people into politically aware responsible citizens by involving them in European political thinking and promoting intercultural understanding.

- Led school debate team to participate in local, national, and international events to shape opinions on current topics and build intercultural understanding and friendships across borders.

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages**: Spanish (Native), Catalan (Native), English (Proficiency), French (Basic), Italian (Basic, learning).
- **Technical**: MATLAB and Simulink, Computer Assisted Design (SolidWorks, CATIA, AutoCAD), Computational Fluid Dynamics (OpenFOAM, ANSYS Fluent), Finite Element Analysis (Ansys Mechanical, Hypermesh), Race Inclined Software (MoTeC, Race Studio 3), Microsoft Office, ICE Simulation Software (AVL Boost), Programming Languages (Python, C/C++, Arduino), Linux Environment and experience in High Performance Computing.
- **Interests**: Aerodynamics, CAD, Simulation, Vehicle Dynamics, Software Development, Engineering, Motorsport, Basketball, Sailing, Driving, Travelling, Food.
- Scrutineer and Timekeeper Trainee by Motorsport UK.
- Marshall Trainee by BMMC (British Motorsports Marshals Club).
- Volunteer Coordinator, Safety Scrutineer and Flag Marshal for Formula Student Spain.
- "A hands-on introduction to engineering simulations" - Certification by CornellX University, edX (2020).
- Level 0 certification (license required to coach in federated leagues) by the Catalan Basketball Federation (2016).
- **Driving licenses**: AM, A1, A2, A, B.

James Montgomery

+44(0)7767 308302 james.montgomery@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

An enthusiastic engineering professional, undertaking an MSc in Advanced Motorsport Engineering at Cranfield University. Possesses a combination of CAD based design, CNC prototyping and composite manufacturing experience, with a strong academic background. Demonstrably proactive and responsible, having taken products from blank sheet to serial production as a project lead in industry. Academic and hands-on experience is complemented by attending courses from the Motorsport Industry Association (MIA); volunteering as a motorsport engineer and establishing The Motorsport Book Club. At Cranfield, has modelled a 2021 F1 Power Unit as part of the "Cranfield F1 Design Sprint", is beginning a thesis project investigating Le Mans Hypercar power units, and is designing an electric powertrain sportscar as part of the Group Design Project.

KEY ACHIEVEMENTS

- Headed MGU-H turbocharger system development for the student led "F1 Design Sprint" at Cranfield University, a project simulating a current Formula 1 power unit.
- Led mechanical development of two new folding table products at Shades Technics from design concept to serial production, resulting in a reduction of labour time by 50% and manufacturing lead time from 3 days to 1.5 hours.
- During Covid-19 UK lockdown, launched 'The Motorsport Book Club' on LinkedIn to create a network of like-minded motorsport students and industry professionals.
- Successfully accepted onto a 'World Challenge' expedition to Peru, fundraising over £3000 for the trip. Hiked the Inca Trek to Machu Picchu and undertook charity work on Amantaní, an island on Lake Titicaca.

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, UK (October 2020 - September 2021)

- **Key Module Projects:** Designed Arduino DRS flap PI control system. Optimisation of aerodynamic setup using a 30% scale wind-tunnel model. CFD development of a multi-element wing in ground effect. Topological optimisation using FEA. Structural analysis of metal and composite aerofoils.
- **Motorsport Powertrains Project:** Modelled and analysed naturally aspirated and turbocharged engines using AVL Boost. Carried out spark timing, compressor map, and two-factor valvetrain optimisation within a set of regulations. Used the generated data to validate BTCC hybrid performance claims for the 2022 season.
- **Group Design Project:** Conceptual design of an electric sportscar powertrain for a new Formula E support series. Currently developing hand calculations and simulation for down selection before detailed design.
- **Dissertation Project:** Development of a torque control strategy for 2021 Le Mans Hypercar powertrain. Currently producing literature review and initial models.
- **F1 Design Sprint (Turbocharger Group Leader):** Led a team in developing the MGU-H system for the AVL Boost model. Investigated energy recovery and release modes and their effect on powertrain efficiency.
- **F1 Design Sprint (MATLAB Tool Group):** Developed MATLAB tools to automate optimisation cycles.

MSc Mechanical Engineering (Distinction): Loughborough University, UK (October 2016 - September 2017)

- **Key Module Projects:** FMEA study of a kart axle, Dynamometer study on ICE pollutants, Conceptual design of an off-road medical vehicle, Advanced simulation of manufacturing processes.
- **Dissertation Project:** Investigated properties of 3G Artificial Turf under torsion. Boot-rubber interaction research resulted in recommendations for design of a downsized, portable, FIFA traction tester. Have since recognised similarities to unsealed track surfaces e.g., WRC stages.

BEng Mechanical Engineering (2.1): Loughborough University, UK (September 2013 - July 2016)

- **Key Modules:** Thermodynamics, Fluid Mechanics, Design of Machine Elements, Materials in Service, Advanced Heat Transfer, Electrical Power & Machines, Turbomachinery, Computer Control & Instrumentation.
- **Industry Based Design Group Project (Group Leader):** Design of a 3-in-1 fire detector, smoke detector and audio-visual alarm with Eaton Corporation.
- **International Design Group Project:** Design of a rural hydrogen fuel-cell system and local infrastructure with Intelligent Energy Ltd.
- **Dissertation Project:** Innovative design to prevent preload loss over time in screwed and bolted antenna joints for Huawei. Reduced preload loss by 40% through two separate methods.

CAREER HISTORY

Shades Technics Ltd: Hoddesdon, UK - Design Engineer (May 2018 - September 2020)
Shades Technics is a supplier to international coach and bus industries, providing bespoke plug-and-play interior facilities.

- Expanded a historic customer's hovercraft product line following a successful pitch. Increased customer investment in tooling from £0 to £40,000, and led production of 25 bespoke, modular GFRP composite moulds and parts against deadlines.
- CAD modelled, CAM programmed, and CNC machined high density foam patterns for composite manufacture
- Responsible for the blank-sheet design of two new folding table products. Worked closely with suppliers on tooling of injection moulded PU and PC-ABS parts and fabricated, CNC machined parts. Both products cut in-house manufacturing time from 3 days to 1.5 hours and cut labour time by 50%.

TestWorks Group Ltd: Letchworth, UK – Summer Intern Engineer (2015, 2016, 2017)
Established in 2001, TestWorks Group Ltd is an innovative technology company offering a comprehensive range of solutions, products and services in the field of electronic and mechanical design, automation, manufacturing and test.

- Constructed PCB test cabinets, managing power distribution requirements to high value measurement equipment for testing and monitoring PCBs. Manufactured bespoke structural components for the cabinets and assembled large quantities of assembly-line electrical components.

EXPERIENCE & VOLUNTEERING

F1 Design Sprint Project: Cranfield University – Team Leader/Member (November 2020 – December 2020)

The Motorsport Book Club: **Online, LinkedIn – Creator** (**August 2020 - Current**)
TMBC posts user-submitted reviews of technical books (https://www.linkedin.com/company/the-motorsport-book-club).

- Created 'The Motorsport Book Club' to compensate for the cancellation of volunteering opportunities in motorsport teams. Goal is to form an industry recommended reading list for students.

MIA School of Race Engineering: Online / Silverstone, UK – Student (July 2020 - October 2020)
The SoRE is a focussed and interactive course to bridge the gap between motorsport and race engineering.

- **Silverstone School:** Participated in 32 hours of lectures from engineers working in F1, FE and 1st tier suppliers.
- **Online Modules:** Aerodynamics, Vehicle Dynamics, Vehicle Simulation.

AB Motorsport: Royston, UK – Volunteer Engineer (February 2020)
AB Motorsport engineer cars in the Mazda MX5 BRSCC, achieving championship podiums in 2020,19,18,17,15 seasons.

- Performed racecar preparation: cleaning, spanner checks, and identifying and replacing critical worn parts.

World Challenge: Peru – Student (March 2012 – April 2012)
World Challenge is a UK provider of overseas adventure travel programs targeted at schools.

- Raised over £3,000 to fund the 4-week trip. Organised activities, travel and accommodation for students and staff. Undertook charity work on Amantaní (an island on Lake Titicaca) and hiked a 4-day Trek to Machu Picchu.

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages:** Fluent English, GCSE Spanish Grade C.
- **Qualifications & Memberships:** St Johns Ambulance First Aid Trained, Member of the Institution of Mechanical Engineers, LinkedIn Learning: 'Being an Effective Team Member'; 'Leading and Working in Teams'.
- **Interests:** Golfer, plays with friends and in competitions. Participated in the McMillan Cancer Support Longest Day of Golf in 2017, raising over £400. Loughborough University Weightlifting and Powerlifting (2015-17). Monks Walk School Rugby Club (2010-2012). F1, Rally, WEC, Sim racing and Karting enthusiast.
- **IT Skills:** Heavy use of SolidWorks, PDM, SolidCAM in employment, and Siemens NX (CAD and FEA) and CATIA at university. University projects using Ansys Fluent, Star CCM, Marc Mentat, Adams & AutoCAD. Wrote point-mass lap-time and piston motion simulators in Python leading up to Cranfield MSc, and signal processing programs in Visual Basic at Loughborough. Multiple AVL Boost engine modelling projects, and developed MATLAB optimisation tool for AVL Boost. Conducted motorsport data analysis in MATLAB, PiToolbox and MoTeC i2.

Iker Raigoso Goitia

+44 (0) 7521 195954 iker.raigoso-goitia@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

A passion and challenge-driven Mechanical Engineer and Advanced Motorsport Engineering MSc student with experience in aerodynamics, heat dissipation, data analysis, composites and team management. Technical skills and understanding of the aerodynamic design route developed through projects like, Formula Student, DrivAer model optimisation in moving ground wind tunnel, optimisation of a F1 Front Wing and development of a Lap-Time Simulator.

KEY ACHIEVEMENTS

- Achieved 17 % lighter aerodynamic package for FSB2019's car with 39.5 % higher ClA (downforce) and 12.1 % higher Cl/Cd (efficiency). Maximum motor temperature was reduced by 50 ºC
- Led 40+ engineering students to design team first all-wheel drive car (EV). Despite pandemic, designs were finished on time and external manufacturing could start in June
- Ranked 1st out of 114 students for Mechanical Engineering BSc

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, Cranfield, UK (September 2020 - Present)

- **Modules:** Motorsport Aerodynamics (Wind Tunnel Testing, Moving Ground); Computational Fluid Dynamics for Motorsport; Motorsport Vehicle Dynamics; Motorsport Structural Analysis; Motorsport Electronics and Data Acquisition; Composite Structures of Motorsport; The Business of Motorsport; Motorsport Powertrains

MSc in Industrial Engineering.: University of the Basque Country, Bilbao, Spain (September 2018 - Present)

- **Specialisation**: Product Design and Manufacture
- **Double Degree**: MSc. in Advanced Motorsport Engineering (Cranfield University)
- **Modules:** Fluid Installations and Machines; Thermal Engines and Installations; Product Lifecycle; Parametric Design and Modeling; Integrated Manufacturing Systems; Business Administration; Thermotechnics…

BSc Mechanical Engineering: University of the Basque Country, Bilbao, Spain (September 2013 - July 2018)

- **Modules:** Computational Fluid Dynamics; Mechanical Design using Finite Elements; Fluid Installations and Machines; Fluid Mechanics; Integrated Management Systems; Project Management; Elasticity and Resistance of Materials; **Machine Design...**
- **Extracurricular:** Entered Talentia Program. Bizkaia Talent. (2016-2017) as first in the year. Participated in professional meetings, workshops and industry activities with AIC, Tecnalia and BEAZ Bizkaia among others.
- **Final Degree Project:** Aerodynamic design of a Formula Student single seater car

CAREER HISTORY

Formula Student Bizkaia: Bilbao, Spain (2017 - 2020)
Formula Student Team of the UPV/EHU. Every year, the team designs, manufactures and competes with a self developed electric formula vehicle. The project complements the engineering training of the students proposing new technical challenges, working with suppliers, being tightened by budgets and managing human and material resources.

Technical Leader (September 2019 - September 2020)

- Led team to accomplish team's first all-wheel drive car (FSB2022) using in-wheel motor technology
- Set team and car objectives and specifications: FSUK2023 1st place, < 200 kg, > 2g (lateral acceleration)
- Defined design, manufacture, assembly and testing periods through a 2-year strategy
- Improved internal communication by organising assembly meetings and creating new task forces that grouped designers from different technical areas in their common sub-assembly. For example, corner sub-assembly involved designers from dynamics, aerodynamics and powertrain departments

Aerodynamics Manager (September 2018 - August 2019)

- Set new aerodynamic designing procedure to align with team's goals
- Organised group tasks, timing, resources and budget. Aerodynamic package was ready for car's shakedown
- Managed new attachment method design for both, front and rear wing, improving CAD- reality correlation. Two nuts laminated in carbon fiber inside the wing (<30 g). Testing and validation (FEA/Traction test): 2.5 kN for a single attachment point
- Led new aerodynamic package design prioritising cooling and mechanical requirements: 17 % lighter, 39.5 % higher ClA and 12.1 % higher Cl/Cd than the FSB2018
- Designed new undertray and sides using vortex structures to improve the sealing and wings to increase the suction of air flow under the car: 121 % higher ClA and 34 % higher Cl/Cd
- Designed a more efficient cooling system in collaboration with powertrain group, reducing motor temperatures at competition by 50 ºC
- Analysed aerodynamic package's cost, risks and environmental impact as Cost and Sustainability group member. Achieved second place in Formula Student UK

Cooling System Engineer (June 2017 - August 2018)

- Responsible for cooling system CAD design, budget, assemble and validation
- Took part in the monocoque and aerodynamic package manufacturing as member of lamination group
- Analysed aerodynamic package's cost, risks and environmental impact as Cost and Sustainability group member. Awarded third place in Formula Student UK and sixth place in Formula Student Spain
- Modelled aerodynamic package for Finite Element Analysis (FEA) to check structural requirements

Teknia XXI: Bilbao, Spain - Product Engineering Internship (July 2016 - June 2017)
Together with the support of Teknia Technologies Business Unit, the component manufacturing is realized through its Machining, Metallic and Plastic Divisions, offering 4 core services: Project management; Design and technical support through engineering and conception; Large scale production facilities; Tool management, engineering and construction.

- Analysed specifications, standards and customer requirements. Company commitment to Quality, internal and external audit: ISO-TS IATF 16949 and ISO 9001 certificates
- Created drawings in AutoCad for parts manufacturing description to improve multi spindle lathes set up quality
- Examined projects progression for first samples and mass production. Kept up to date parts status and technical drawing versions of commercial, technical, production, quality, purchase and logistic departments
- Organised outsourcing: Machining operations, electroplating, heat treatments
- Managed product packaging: specifications, design and purchase

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages:** Spanish (Native), Basque (Native), English (Fluent, Cambridge English Level 2 Certificate in ESOL International (Advanced), Cambridge Assessment English. (May, 2018))
- **Technical Skills:** Star-CCM+, Ansys (Fluent, Static Structural, Composites and Modal Analysis), CAD (Catia V5 and 3DExperience, Solidworks, Autodesk, AutoCAD), MoTeC i2, Pi Toolbox, Matlab/Simulink, Altair HyperMesh
- **Hobbies:** Motorsport, Engineering, Climbing, Visiting new places
- **Martial Arts:** Trained in Taekwondo from 2002 to 2016, national medallist, team broke Basque Country records
- **Certificates:**
    - Trackside Aerodynamics, Motorsport Engineer. (February, 2021). Instructor: Xavier Ballesta, current F1 senior aerodynamicist.
    - Introduction to Race Car Aerodynamics, Motorsport Engineer. (September, 2020). Instructor: Adrian Villar Collazo, ex F1 aerodynamicist.
    - Self-Leadership. (April, 2018)
    - Advanced Concepts in CFD for Formula Student Workshop, SimScale GmbH. (March, 2018)
    - FEA in Formula Student & FSAE Workshop, SimScale GmbH. (December, 2017)
    - Creative Talent Training. (November, 2017)
    - Automotive Immersion Program, AIC-Automotive Intelligence Center. (July, 2017)

Margaux Verza

+ 33.6.42.12.05.67 m.verza@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

Passionate about motorsports currently completing the MSc Advanced Motorsport Engineering at Cranfield University. An active participant in a Porsche Motorsport Championship in France, education and hands-on experience has given a complete understanding of the motorsport environment. Multiple work experiences within the sector have developed multiple technical and personal skills. International experiences have led to an adaptable personality and ability to work in a unknown environment. Combined experiences cultivated an eagerness to achieve the goal of becoming an engineer and a test driver while being a female in a Motorsport Team.

KEY ACHIEVEMENTS

- Completed one semester-long research internship abroad with Renault Bucharest Connected
- Elected president of the school sport association, managed a team of 20 people, organised events of more than 150 people
- Upgraded Renault Sport Cars' old suspension deflection measurement systems to a new system running on MATLAB and tested it on the new Megane RS Trophy R
- Racing driver in the Porsche Motorsport Sport Cup Challenge with a Porsche Cayman GT4 MR (Porsche Club Motorsport France) since 2018

EDUCATION

MSc Advanced Motorsport Engineering: Cranfield University, Cranfield, UK (October 2020 - September 2021)

- **Modules:** Composite structures for motorsport, Computational fluid dynamics for motorsport, Motorsport aerodynamics, Motorsport electronics and data acquisition, Motorsport powertrain design, Motorsport structural analysis, Motorsport vehicle dynamics, The business of motorsport.
- **Group Design Project:** Corona charge – Design of an electric sportscar for international championship events. The car will be an open cockpit design similar to the Radical RXC Spyder. Events will be typically 30 minutes plus 1 lap, as a potential support series to Formula-E.
- **Individual Research Project:** Topic TBC.

Master of Automotive Engineering: ESTACA, Saint-Quentin-en-Yvelines, France (September 2015 - September 2021)

- **Modules:** Multi-physics Modelling, Modelling & Control of electric actuators, Transmission & Gearbox technologies, Powertrain performance, Continuum mechanics, Structural dynamics, Strength of materials, Hydraulic systems, Real time operating systems, Real time control braking, Finite element method.
- **Project:** E-Kart – Design of an electric go-kart for international championship.

CAREER HISTORY

Renault Bucharest Connected: Bucharest, Romania - Engineer Research Assistant (May 2019 - November 2019)
Renault Bucharest Connected is the home of Groupe Renault Romania and this stands proof to the experience of building solid relationships with some of the largest corporations in the world. The building will incorporate a design centre, where their specialists will design the future cars models.

- Researched a system to replace and connect the LCD with a personal device on the new Dacia Duster
- Created and developed different prototype designs using CATIA allowing for efficient updates
- Utilized 3D printers for 2 projects (Screen support, camera mirror) enhancing speed and cost of production

Porsche - 2018 Paris Motor Show: Paris, France - Car Explainer (October 2018 - October 2018)

Porsche AG is a German automotive manufacturer specializing in high-performance sports cars, SUVs and sedans. The headquarters of Porsche AG is in Stuttgart, and the company is owned by Volkswagen AG, a controlling stake of which is owned by Porsche Automobil Holding SE.

- Welcomed and introduced an average of 100 clients per day to the constructor's vehicles. Answering the customer's questions and directing future clients to a commercial in the event of a potential sale
- Updated datas of the customers for the Customers relationship management (around 100 per day)

Renault Sport Cars (MAP LAS): Les Ulis, France - Engineer Assistant (July 2018 - August 2018)
Renault Sport Cars, commonly known as Renault Sport (RS) is the performance and special vehicles divisions of Renault.

- Created an assistive software development to help measurement and analysis of the suspension's deflections
- Tested the software on the new Megane RS Trophy - Les Ulis (78) and on the Trophy-R on the Nürburgring (September 2018)

ACO (Automobile Club de l'Ouest): Le Mans, France - Hostess 24h of Le Mans (June 2018 - June 2018)
The Automobile Club de l'Ouest, sometimes abbreviated to ACO, is the largest automotive group in France. It was founded in 1906 by car building and racing enthusiasts and is most famous for being the organising entity behind the annual Le Mans 24 Hours race.

- Welcomed and supervised paddock entrance (256,900 people attended the race)
- Greeted VIP visitors (200) in the lounge, checked identities, helped serving drinks and food as requested

ESTACA - E-kart project: Saint-Quentin-en-Yvelines - Head of the "Dynamics and Structure" division (September 2017 - May 2018)
The Ecole Supérieure des Techniques Aéronautiques et de Construction Automobile or, in short, ISAE-ESTACA trains engineers specialized in the fields of transportation. In addition to its training activity, the school also conducts applied research for the benefit of actors in the aeronautics, automotive, space, guided transport and naval sectors.

- Led the "Dynamics and Structure" division, in charge of the study and design of the chassis
- Analysed costs and materials for each part of the chassis
- Formulated a proposition of the final solution in May 2018 over four teachers and professionals

MILAN Competition: Agen, France - Trainee Engineer (June 2017 - July 2017)
Created by Nicolas Milan, Milan Compétition quickly became a reference structure in branded cups. The team has developed within the Renault Sport family, but also Peugeot sport and since 2018 in the Alpine Europa Cup.

- Analysed race car data after each practice with the pilot (6 different cars)
- Managed the strategy, cars monitoring, set-up definition and driver's improvement

Horizon BMW-Mini: Courbevoie, France - Worker Trainee (July 2016 - July 2016)
Horizon is a network of BMW dealerships in Paris (75) and Ile de France (75, 77, 78, 91, 92, 93, 94, 95)

- Effectuated cars maintenance (draining, change of different filters etc.)
- Examined of diagnostic data and programming of BMW and Mini vehicles

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages:** French (Native), English (TOEIC: 925/990), Romanian (basic knowledges)
- **IT Skills:** Catia V5, Microsoft Office Suite (Word, Excel and PowerPoint), Simulink experience (MATLAB), AVL Boost, ANSYS Fluent
- **Racing experiences:** Racing driver (Porsche Club Motorsport France), Test days on the main French circuits (Porsche 997 GT3). Pilot in the Motorsport Sport Cup Challenge (2019: Porsche 996 Cup, 2020/2021: Cayman GT4 MR)
- **Ranking:** *2019*, 2/10 in slick category, 5/23 overall. *2020*, 1rst in category and 1rst in championship (after 3 races - September 2020)
- **Sports:** Horse competition (G5), skiing

Letian Wang

+44 7743912662 letian.wang@cranfield.ac.uk
Cranfield University

PERSONAL STATEMENT

An automation control BSc and aerospace MRes degree holder with mechatronics work experience in hybrid powertrain and battery management system. Knowledge of the aviation sector and helicopter maintenance due to previously working as a helicopter engineer. Current MSc student in Advanced Motorsport Mechatronics in Cranfield University. Proficiency in MATLAB/Simulink, C/C++, Python, MPC/LQR controller design, CAN bus protocol communication, system maintenance, and failure identification. Previous academic and work experience has enabled the development of outstanding communication skills with fluency in Chinese and English. Interested in driving kart and other motorsport related activities.

KEY ACHIEVEMENTS

- Proposed a real-time battery state of charge (SOC) estimating algorithm; published paper “Online battery pack state of charge estimation via EKF-fuzzy logic joint method” (IEEE CoDIT 2018).
- Developed a hardware-in-the-loop (HiL) system for hybrid powertrain system and collected experiment data; published a paper named “Control and Optimization of Hybrid Electric Propulsion System for Light Aircraft” (IET Journal of Engineering, 2018).
- Awarded second-class prize in Beijing district for National Undergraduate Electric Design Contest (top 16% in 09.2015).
- Received scholarship for academic excellence in School of Automation (top 20% in 09.2015, 03.2015, and 03.2013).

EDUCATION

MSc Advanced Motorsport Mechatronics: Cranfield University, Cranfield, UK (October 2020 - September 2021)

- **Modules**: Motorsport electronics and data acquisition, Advanced control and optimisation, Motorsport powertrain design, Mechatronics modelling for vehicle system, Embedded vehicle control system, Vehicle control application, Motorsport vehicle dynamics, The business of motorsport.
- **Group Design Project**: Chassis design for an electric sport vehicle.
- **Individual Project**: Design of the traction control system for electric racing vehicles using in-wheel motors.

MSc by research Aerospace: Cranfield University, Cranfield, UK (December 2016 - August 2018)

- **Department:** Centre for autonomous and cyber physical system.
- **Research Topic**: Hybrid electric propulsion system and battery management system.

BSc Automatic control: Beijing Institute of Technology, Beijing, China (September 2012 - July 2016)

- **Modules**: Automatic control theory, Advanced mathematic analysis, Linear algebra, Intelligent control theory, Data structure and algorithm design, PLC practice and field bus, C/C++ language programming, Fundamentals of electric transmission, Signals and systems, Engineering mechanics.

CAREER HISTORY

State Grid General Aviation Co. Ltd, Beijing, China - Mechatronics Engineer (March 2019 - September 2020)
State Grid General Aviation is a wholly owned subsidiary of State Grid Corporation. Its main business is power transmission line inspection based on helicopters, UAVs, data fusion, and image processing.

- Cooperated with technician teams to maintain AIRBUS H125 helicopter; completed 300Hour-level maintenance including main gear box, rear gear box and onboard battery system three times.
- Fixed emerging issues, such as main rotor hub damper failure, occurring in helicopter operating; provided efficient responses to ensure operations could continue in a timely manner.
- Researched the state-of-art design architecture of UAV-based automatically powerline inspecting system. Proposed a dual-drone powerline inspection working mode for mountain area.
- Cooperated with a third-party for the UAV beyond visual-line operation system (BVLOS) design. The prototype UAV system is tested on a 10 kV powerline for 1 km.

AIRSTART project, Cranfield University, Cranfield, UK - Researcher (December 2016 - May 2018)
AIRSTART is to drive UK leadership in small commercial UAS (Unmanned Air Systems <150kg) and enable safe operation BVLOS and increased endurance by hybrid electric propulsion system.

- Built a HiL test platform for the hybrid electric propulsion system based on CAN bus, RS232, RS485, and Simulink-based controllers; HiL system was verified under different working modes.
- Compared different control methods (EKF/PF/SVM) used in battery management systems for cell balancing, SOC and SOH estimation.
- Proposed and Implemented an EKF-Fuzzy logic battery pack SOC algorithm; published this algorithm in the IEEE CoDIT conference.
- Developed a real-time optimal controller (based on ARM embedded board with ECMS, Fuzzy logic control method) for engine/electric motor power allocation.
- Constructed a hardware frame of the hybrid propulsion system test rig and battery pack.

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Memberships:** IET student member (1100901602).
- **Languages**: Fluent English (BEC Vantage B2), Native Chinese speaker.
- **Professional Skills**: Confident IT user. Proficiency with AVL boost, MATLAB & Simulink, C/C++, ARM based embedded development, Controller design (MPC, LQR, Sliding Mode), Vehicle modelling.
- **Individual Interests**: Karting racing, Formula E, Football, Music, Travelling.
- **Volunteering:** Volunteering supporter for Cranfield Simulation for Christmas event in Silverstone Experience centre; Volunteering teacher for a primary school in disadvantaged area in Hannan province, China.

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E: cranfieldcareers@cranfield.ac.uk T: +44 (0)1234 758190