Michail Chalkiopoulos

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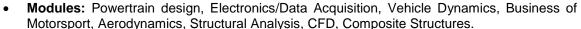## PERSONAL STATEMENT

A **mechanical engineer** with working experience in high level motorsports such as **Formula One**, **Formula E** and **BTCC**. Combines theoretical knowledge with hands on experience as a racing driver, mechanic and a race engineer. With a strength in **vehicle dynamics and mechanical design** that is backed up by a very **solid background in physics and mathematics**. Specialises in racecar **vehicle dynamics simulations, suspension design and setup**. Recognised for the **tool building abilities**. Passionate, team-driven and eager to learn and take on and manage big and challenging projects while utilising resourceful problem-solving skills and the ability to deliver under pressure.

KEY ACHIEVEMENTS

- Won the Motorsport UK best technical presentation award for the Cranfield Group Design Project.
- Won an "Honorable Mention" in the 43rd International Physics Olympiad (IPHO) in 2012.
- Multiple Greek National champion in karting.

EDUCATION

MSc Advanced Motorsport Engineering (1:1): Cranfield University, Cranfield, UK
(September 2018 – September 2019)

- **Modules:** Powertrain design, Electronics/Data Acquisition, Vehicle Dynamics, Business of Motorsport, Aerodynamics, Structural Analysis, CFD, Composite Structures.
- **Group Project:** *'Hybrid F2 sidecar with LPG conversion design and performance projection'*.
- **Individual Thesis:** *'Electric Racing Academy (ERA) Gen1 single seater chassis development and vehicle dynamics analysis'*.
  The thesis uses a custom fully transient vehicle dynamics software (MATLAB/Simulink) for the performance analysis and rear chassis design of a new electric single seater.

MEng Mechanical Engineering (2:1): National Technical University of Athens, Athens, Greece
(October 2012 – February 2018)

- **Modules:** Mechanical Modeling and Dynamics, Power Hydraulics & Pneumatics theory and modeling, Thermodynamics theory and modeling, Machine Elements, Thermal & Hydraulic Turbomachines, Computational Fluid Dynamics, Aircraft & Jet Propulsion, Aircraft Control, Industrial Electronics, Automatic Control Systems & Machine Regulation, Electric Circuits & Motors, Advanced Materials, Finite Element and Crash Analysis of Structures, Ground Vehicle Design, Internal Combustion Engines.
- **Group Projects:** *'Analysis & Design of a 6-speed sequential gearbox for a KZ2 kart', 'Analysis & Design of a Tunnel Boring Machine (TBM)', 'Calculation of life-cycle of a McPherson strut lower control arm with use of experimental data'*.
- **Diploma Thesis:** *'Analysis & Design of a Racecar Suspension'*
  The thesis demonstrates the creation of a custom quasi static lap time simulation software in MATLAB as well as the mechanical design of the front suspension of a group 5 historic racecar.

VEHICLE DYNAMICS PERSONAL PROJECTS AND EXPERIENCE

Vehicle Dynamics Simulation Software Design

- Lap Time Simulation: Point Mass and Quasi-Static (3 and 4 wheels with full suspension) models.
  - Features: Dynamic CoG, yaw motion simulation, track modeling
  - Results analysis: Direct results export in .ld format and post-processing/analysis in Motec i2.
- Transient Vehicle Simulations: Driving scenarios, frequency response and tyre/suspension load estimations.
  - Features: Ride height aerodynamic maps, engine maps, gear selection logic, differential model with adjustable ramps and preload.
  - Solver: Force based and uses the four lumped mass approach with full kinematics.

Multi Body Kinematics Simulation Software Design

- Suspension Systems: Double-Wishbone/MacPherson analytical solver and Multi-Link numerical solver.
- Features: Virtual assembly of parts, suspension variable optimization (ex. bump-steer), suspension element and chassis force analysis and deformations simulation, STL CAD import.

Tyre Modeling Software Design

- Features: Processing (pre and post) of tyre test rig data and Pacejka model fitting.

CAREER HISTORY

Williams Grand Prix Engineering Formula 1 (February 2021), Simulation Development Engineer
- Development of new generation multi-body vehicle model.
- Vehicle model integration and development in the driver in the loop simulator.
- Creation of new vehicle dynamics tools and development of current toolset.

Mercedes AMG Petronas Formula 1 Team (July 2020-December 2020), Graduate Process Analyst
- Analysis of the manufacturing processes in the machine shop department.
- Working on projects that will help the team achieve the cost cap restrictions.
- Was selected to complete an automation project for the CTO of the company.
- Working in the Race Support Room during races.

OpenLAP Simulation Software (April 2020), Creator
- Created and released OpenLAP, an open source lap time simulator coded in MATLAB.
- Produced an educational YouTube video series explaining OpenLAP's code and functionality.

Target Racing (Pre-Season 2020), Race Engineer
- Race engineered one car in the European Lamborghini Super Trofeo Championship testing.

Envision Virgin Racing Formula E (Season 2018 – 2019), Mission Control Engineer
- Conducting competitor analysis feeding information to the strategy engineers on track.
- Created a custom MATLAB software used for post-race analysis of Alkamel "json" data.

AMD Tuning BTCC Racing Team (Season 2019), Data Engineer
- Race car electronics and team data server setup and maintenance.
- Conducting data and onboard footage analysis for driver coaching and set-up assistance on ex-F1, Indy Car and Lemans driver Mark Blundell's and Jake Hill's cars.

Eurotech BTCC (May 2018 – June 2018), Vehicle Dynamics Engineer
- Reverse engineered the RML BTCC suspension and created a full multi-link kinematics and dynamics MATLAB software with a BTCC car specific GUI for setup change evaluations.

NTUA's Formula Student Team – Prom Racing (January 2013 - July 2017)
Vehicle Dynamicist, Mechanical Designer, Manufacturing & Assembly Leader (Seasons 2013-2016)
- Manufactured all non-composite parts for the team in 2016, ensuring proper GD&T (circa £20k).
Team Captain (Season 2017).
- Secured sponsorships with Bosch Greece, CNC Solutions and the Hellenic Aerospace Industry.
- Managed the mechanical design, manufacturing and track testing groups.

International Physics Olympiad (August 2012), Greek National Physics Team Member
- Part of the five-member team that represented Greece in the 43rd International Physics Olympiad of 2012 in Tallinn, Estonia. Received an "Honorable Mention".

Silk Oil Eagle Racing Team (Season 2002 – December 2020)
- Experience in CNC manufacturing and racecar engineering on Super Tourers and Formula 3s.
- Multiple national karting champion (KZ2 & other categories), multiple South Eastern European Championship race winner and participant in the 2007 Rotax-Max Grand Finals.

SKILLS, INTERESTS & EXTRACURRICULAR ACTIVITIES

- **Languages:** Native Greek, Fluency in English (IELTS band 8 & University of Michigan Proficiency in English Certificate) and Swedish (Half-Swedish from mother side & attended the Swedish school in Greece).
- **CAE - CAM Skills:** SolidWorks, ANSYS Suite (Mechanical, SpaceClaim, Fluent), LS-Dyna, SolidCAM.
- **Programming:** Modelica, Dymola, MATLAB, Simulink, Python, VBA, Tibco Spotfire.
- **Racecar Data Analysis:** AIM Race Studio 2, PI Cosworth, Motec i2, RaceWatch.
- **Individual Interests:** Motorsport, karting, car building/ tuning/ racing, CNC manufacturing, basketball, bicycle riding, practical shooting, spearfishing.