

# Efstathios Siampis

## Vehicle Dynamics and Control Engineer

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Experienced automotive engineer with expertise in a wide range of topics within the vehicle dynamics and control area, specialising in vehicle and tyre modelling, optimal control and estimation. Proven success record resulting from his skills, working ethos and ability to function independently as well as part of a team. Passionate about automotive engineering, loves a challenge.

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### **EXPERIENCE** Vehicle Dynamics and Control Engineer: Delta Motorsport, July 2016 to date Achievements:

- Leading the Vehicle Dynamics development within the company:
  - AID-CAV (InnovateUK funded, active) : using advanced control strategies for an omni-directional autonomous electric vehicle
  - Ariel Hipercar (InnovateUK funded, completed) and Ariel Hipercar2 (APC funded, active) : limited-volume production project, with special emphasis on code optimisation and safety standards
  - A Four Wheel Drive high performance electric vehicle equipped with a brake-by-wire system (major OEM, recently completed) : exploration study on the application of optimisation techniques for deriving the best-possible combination of actuators while taking into account their specific capabilities (motor and brake system response characterisation)
- Definition of a complete Vehicle Dynamics Control framework for creating and validating a range of control strategies applicable to electric vehicle platforms of different complexity. Based on the Vehicle Dynamics Control framework:
  - Creation and validation of a detailed vehicle dynamics model
  - Design and testing in simulation and on the prototype electric vehicle of optimal estimation and control strategies
- Supervision of several MSc and Master-by-Research students

**Technical Consultant:** Jaguar Land Rover – Electric ABS project, fixed term contract, September – December 2015

External consultancy to JLR's project on advanced electric ABS strategies for electric cars using linear and Extended Kalman Filters.

**Concept\_e project, InnovateUK:** Jaguar Land Rover (lead partner), Cranfield University, September 2013 – December 2015

Achievements:

- Working effectively within project team of ten members, contributing to individual members' projects on top of own work
- Design and testing of estimation strategies and delivery of a range of Torque Vectoring control strategies in Carmaker, Hardware-In-the-Loop simulation and on three prototype vehicles

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## EDUCATION

**Self-Driving Car Engineer:** Udacity, 2019 (in progress)

Selected Topics: Computer Vision, Deep and Convolutional Neural Networks, Sensor Fusion, Localisation Techniques, Path Planning Algorithms, Feedback Control Strategies for Path Following

**PhD Engineering:** Cranfield University, 2013 – 2016

“Optimal Torque Vectoring Control Strategies for Stabilisation of Electric Vehicles at the Limits of Handling”, EPSRC DTA funded.

This research project investigated an active system for optimal control of a Rear Wheel Drive electric vehicle in cases of terminal understeer behaviour using a range of optimal control strategies.

Research topics include: vehicle and tyre modelling of different levels of fidelity, target generation, optimal control strategies ranging from a Linear Quadratic Regulator to a Nonlinear Model Predictive Controller and estimation strategies using Extended and Unscented Kalman Filters.

Publications: 4 articles, 7 conference papers.

**Numerical Optimal Control with Differential Algebraic Equations:**  
University of Freiburg, February 2016

Selected topics: Single and Multiple Shooting, Direct Collocation methods, Sequential Quadratic Programming, Interior Point methods

**Underactuated Robotics:** MIT OpenCourseWare, July 2015

Selected topics: Direct and Indirect Optimisation Methods, Randomised and Feedback Motion Planning, Stochastic Optimal Control

**BEng Mechanical Engineering with Automotive Design:** Brunel University, 1<sup>st</sup> Class Honours, 2009 - 2012

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## SKILLS

### TECHNICAL

Real time controller development; Vehicle and Hardware-In-the-Loop (HIL) testing and data analysis; Vehicle modelling and target generation; Optimal control and estimation strategies

### SOFTWARE

Programming Languages: MATLAB & Simulink, Python, C++

Optimisation solvers: GPOPS-II, YALMIP, Embotech FORCES Pro, ACADO Toolkit, CasADi Toolkit

Machine Learning: Google Tensorflow & Keras

High-Fidelity Vehicle Simulation: CarSim, CarMaker

RCP and HIL: DSpace and Pi Innovo toolchains

### SOFT SKILLS

Creative approach; thinking outside the box; effective in working independently and as a member of a team; excellent communication and presentation skills (adapting style to target audience); ability to deliver excellent results across multiple concurrent projects within set deadlines

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References available upon request