

PROFESSIONAL EXPERIENCE

WECORP Industries

London

Defence challenger, startup. World-leader in the development of indoor/outdoor capable multirotor craft with 1-1.5kg payload.

Simulation Engineer (Flight Dynamics) ■ Autonomy (Control & Planning)

Jun. 2019 - Oct. 2020

- Introduced simulated environment as virtual sandbox for the development of new navigation & control algorithms, performance tracking and design sensitivity analysis. Led model & workflow development using Gazebo Simulation tool.
- Navigation & control software stacks included. Software- or Hardware-in-the-Loop. In-use by multiple developers daily.
- Worked with AI & Software Integration to redesign AI pipeline (designed for Nvidia Jetson devices) for desktop simulation.
- Refactored much of the navigation codebase, including nodes for identifying targets (AI) and fusion with lidar data.
- Assisted aerodynamic investigations into propeller performance & craft stability. Produced models for motor/propellers.
- Took on what was required in a fast-paced environment: authored, tested & maintained payload module interface (state machine); provided technical support during testing & user demonstrations; coordinated integration of final targeting solution.

Williams Grand Prix Engineering

Grove, Oxfordshire

Formula 1 Team. Family owned. 7 Drivers' Championships; 9 Constructors' Championships.

MEng Thesis ■ Vehicle Dynamics & Simulation, Driver-in-Loop Simulator

Jan. - Jun 2019

- Aimed to quantify driver effect around specific non-linearities in aerodynamic response, and capture in desktop simulation.

Industrial Placement ■ Vehicle Dynamics & Simulation

Aug. 2017 - Sep. 2018

- Vehicle Dynamic 'pre-event' study completed before each race weekend in order to produce performance gradients of key setup parameters. Process re-designed in order to increase the reliability of results, and automated for speed.
- Implemented new techniques for comparing car performance in tyre saving conditions and predicting laptime effect of coupled setup changes whilst neglecting secondary effects.
- Maintained car model parameters for simulation & setup. Included sourcing and fitting test data for mechanical components, and ensuring correlation with response seen on-track. Worked to develop new models for suspension and fuel system.
- Projects completed with the Aerodynamic Concepts Group & Fuel Systems. Developed models to predict performance potential for design proposals in order to provide a Vehicle Dynamics recommendation on priority given to certain projects.
- Supported the Friday Free Practice sessions in order to provide the Performance Group to produce updated sensitivities after correlating the baseline to latest conditions on track, as well as reacting to any simulation requests during the sessions.

Imperial College Aeronautics Department

London

Formula Student Conceptual Car Design. 2018 Rules & Reg.'s Compliant. (Group Design Project, Y3)

Technical Director

Jun. - Jul. 2017

- Led 22 person team. Sensitivity driven approach. Estimated result in top 10 with 30% of previous top-scoring team's budget.

EDUCATION

Imperial College London

London

Aeronautical Engineering ■ Masters of Engineering (M.Eng)

Aug. 2014 - Jun. 2019

- MEng. Thesis: Quantification of Driver Effect Around Significantly Non-Linear Aerodynamics (Jan. - Jun. 19)
- Highest Cohort Grade: High Performance Computing (97%)
- Highest Performance Index: Group Design Project (Y1)
- Vice Captain, 2016-18 - Imperial College (IC) Gliding Society ■ Webmaster, 2016-17 - IC Aeronautics Society

Inverurie Academy

Inverurie, Aberdeenshire

3 Scottish Advanced Highers ■ 5 Highers ■ 8 Standard Grades

Aug. 2008 - July. 2014

- Maths, Physics, Chemistry at Adv. Higher (A1, A1, A2; A-level equivalent A*A*A).

PROJECTS

🔗 [kierandwn](#)

🔗 quad:

Jan. 2020 - Present

Full control & navigation solution for quadcopter. Applying techniques learned in Autonomous Flight and Spacecraft Dynamics & Control courses. To be tested in simulation, built & then flown.

- Cascaded position control law that specifies desired attitude and rates based on high-level instruction. (complete)
- Attitude control law that linearises closed loop response. (complete)
- Statistical models applied to sensor data and known system dynamics to obtain state estimate (Kalman filters). (complete)
- Computer vision model used to infer pose so user can interact with craft through body language.

🔗 insight:

Nov. 2020 - Present

Source agnostic time-series viewer. Takes inspiration from F1 telemetry solution, ATLAS, and the comprehensive per-user configurability of Atom Text. Qt Framework. Prototyped in Python. To be open-sourced after migration to C++.

HOBBIES

Gliding ■ Photography (Category Winner, NUPS London Photohunt 2014) ■ Skiing/Snowboarding ■ Cycling