

Rik Williamson

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github.com/rikeroo

Education

University of Sheffield – Master of General Engineering (Mech) Predicted: First July 2024

Projects

Thin-film Process Control and Optimisation with Reinforcement Machine Learning

- Developed a Deep Learning Neural Network to model a slot-die thin-film manufacturing process and used Reinforcement Learning for control and optimisation (on going)

Open-source hardware Habit Reminder

github.com/rikeroo/habit-reminder

- Independently developed custom PCB using KiCad based on a bare ESP32 C3 module
- Specified components using data sheet attributes, taking into account availability, cost and performance
- Created firmware in C++ using Object Oriented Programming; integrating external ToDoist APIs, an NTP Client, Webserver, OLED display, NeoPixel LEDs and physical user input

Design and prototyping of Fighting Robot to Compete in a National Tournament

- Created a report detailing overall robot design, legal and standardisation concerns, data management, quality management, marketing and sustainability
- Designed a high torque, highly controllable robot drive system using BLDC motors and belt driven gear reduction, within severe packing constraints
- Created performance testing setups for stall torque and velocity reversal to fine-tune ESC programming and evaluate situation specific performance

Non-Linear FEA Model for new and aged Engine Mounts

- Created a non-linear FEA model for a multi-material elastomer-hydraulic engine mount
- Developed mesh refinement studies to determine most computationally efficient areas of geometry to refine whilst retaining sufficient model accuracy
- Verified results using mesh convergence studies
- Validated results against experimental DIC, discussing reasons for discrepancies as well as limitations of FEA models

Experience

Web Developer Intern, Rent4Sure – Norwich

July 2016

- Developed and published a News section for the main production site with PHP and SQL
- Worked with production database, making SQL requests and observing strict data privacy policies
- Worked effectively in a team, taking into account requirements of designers, management and marketers

Skills

Design Tools: Ansys Fluent, Ansys Mechanical, Fusion 360, KiCad, XFoil

Languages: Python, C++, MATLAB, Java, PHP, SQL

Hobbies/Interests

Cycling: Competed in Downhill Mountain biking, commute by bike and explore with a Gravel bike

Climbing: Competed in Bouldering, placing 1st in several regional competitions. Continue to climb recreationally indoors and outdoors with frequent trips to the peak district to boulder

HomeLab: Maintain a local network, with a type-1 hypervisor virtualising multiple linux servers, a docker host, and a network file share