Neal Batchelor

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Education

University of Warwick *2024 - 2028*

- Bachelor of Engineering, Mechanical Engineering
- First year grade: Upper Second-Class Honours (69%)

Northampton Academy *2022 - 2024*

- Maths, Further Maths & Physics at A-Level
- Physics subject specialist, tutored Year 12s on A-Level Physics content
- EPQ: How to maximise the safety of Formula One racetracks whilst still creating challenging circuits

Experience

Engineer Intern, Mahle Powertrain *April 2023*

- Conducted post-test failure analysis and disassembly on a prototype V12 engine after a dynamometer stress test
- Performed Finite Element Analysis (FEA) using Ansys Mechanical to model component wear and test reliability
- Applied non-destructive testing techniques, including fluorescent penetrant inspection, to identify material defects and inform quality assurance and maintenance processes

Projects

Material Analysis & Selection

- Performed destructive testing to gather experimental data from various steel and aluminium alloys
- Identified unknown alloys by comparing experimental data against known values in Granta Edupack
- Developed performance indices to screen and rank materials by technical specifications and cost-saving analysis

Self-Balancing Robot

- Developed a PID control system in Simulink to enable a two-wheeled Arduino robot to balance autonomously
- Applied the Ziegler-Nichols tuning method for initial calibration, then iterated to optimise PID values
- Implemented saturation blocks to ensure the motor inputs from the PID controller were within a safe and usable range for the motor, preventing component failure

Piston Modelling and Engine Animation

- Conducted a full disassembly of a 50cc 2T engine in order to record dimensions and sketches of the piston
- Used these to develop an accurate 3D CAD model and create photorealistic renders of the piston in Fusion 360
- Produced professional 2D engineering drawings and animated an engine cycle after creating a dynamic assembly

Robotics Team Lead

- Led a team of 9 students in a national robotics competition, driving a continuous improvement cycle, applying root cause analysis and iterating on designs to achieve consistency and reliability, thus becoming two-time county winners

Skills

Software: Fusion 360, Ansys Mechanical, Granta Edupack, Simulink, Arduino IDE

Languages: Python, MATLAB

Interests and Hobbies

My passion for motorsport ranges from BTCC to F1. I am an active karting competitor and have recently built a custom racing simulator. Outside of engineering-focused hobbies, I enjoy rock climbing and play both the flute and saxophone, having volunteered in a local community orchestra and band.