Thomas Pitcher

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As a final year Mechatronics Engineering (Honours) student at the University of Queensland, I am deeply passionate about the field of artificial intelligence and its potential to revolutionize the robotics industry. With a strong desire to contribute to the advancement of AI technology, I aim to leverage my skills and knowledge to make a meaningful impact in improving people's lives and experiences.

Education

Bachelor of Engineering (Honours) – Mechatronics | University of Queensland — Graduating Nov 2023

- **Deans Commendation for Academic Excellence** | Awarded for having a minimum GPA of 6.6 in a semester.
- **2022/23 UQ EAIT Ambassador** (Engineering, Architecture, and Information Technology) | Inspiring the next generation of engineers, architects, designers, and computing professionals by engaging prospective students through events, high school workshops and social media channels.
- **UQ Leaders @ EAIT**
- **2020 UQ Leadership and Mentoring Program**

Experience

Undergraduate Engineer | Herrenknecht Australia — Aug 2022 - Present

- Provided high-quality engineering services for multiple major tunnelling projects across Australia, including Cross River Rail, Sydney Metro, and West Gate Melbourne.
- Responsible for contributing to mechanical design and prototyping using **CAD**, designing electrical systems, programming **PLCs**, procuring off the shelf and manufactured parts, and effectively communicating with clients to ensure project success.
- Through my experience in these areas, I gained a strong understanding of the complexities and challenges of tunnelling projects, and I was able to make valuable contributions to each project's success.

Academic Tutor | The University of Queensland — Feb 2023 - Present

- Leading tutorials and laboratory exercises for 3rd year electrical engineering students in ELEC3004: Signals, Systems, and Control.
- Creating learning content through **TeX, MATLAB** and **embedded system programming** to reinforce understanding of key topics.

Academic Tutor | A-Team Tuition — Jan 2021 – Aug 2022

- Tutoring specialists and methods mathematics, physics, and chemistry to a wide range of students ensuring effective and efficient learning. Writing weekly reports on learning goals and progress and communicating with parents and teachers.
- Led a tutor group of high achieving Marist College boarding students inspiring collaboration and active learning through engaging activities.

Projects

Reinforcement Learning for Robotic Manipulation | github.com/Pitcherrr/Active_Search

- Engineering honours thesis project on new methods of Reinforcement Learning to enable robotic manipulators to navigate and acquire target objects in cluttered and unstructured environments.
- Applying deep reinforcement learning to point cloud data from an Intel RealSense depth camera mounted on a Franka Panda robotic arm within UQ robotics perception planning and Leaning lab under the supervision of Dr Jen-Jen Chung.

Tractor Pull |

- Created a battery powered brushless motor vehicle weighing less than 10kg capable of pulling a 70kg sled up a slope.
- Calculated and constructed an electrical drive system capable of outputting 100Nm at the wheels.
- Utilized advanced manufacturing techniques to create precision parts from CNC, laser cutting, 3D printing and lathes.

Technical Skills

Programming Languages: Python, MATLAB, C, TeX. | **Packages:** PyTorch, PyBullet, OpenCV, Open3d | **Platforms:** Linux, ROS (Robot Operating System), MicroPython. | **Software:** KiCad, Inventor, AutoCAD, PTC Creo, Fusion 360, Simulink. | **Hardware:** STM32, ESP32, Arduino, Rasberry Pi 4, LiDAR, GPS, IMU, General analog/digital sensors, 3D Printing.