Chris Vail Computer Vision Engineer

Education

MEng Design Engineering 2018-2022
Imperial College London

Graduated with first class honours, achieving Dean's list award for academic achievement twice.

Excelled in robotics research, sensing and IoT, machine learning, additive manufacturing and neuromechanics modules.

Projects

Procedural Scene Generation for Robotic Disassembly of Waste Electronics
Computer Vision, Reinforcement Learning

Research highlighted screw identification and removal as roadblocks to robotic disassembly.

I developed a pipeline for procedural synthetic scene generation in Blender to train image segmentation and 6D pose estimation models.

These were then used to localise screws within 1.8mm and remove them using a UR5 arm with a custom end effector.

Worked towards achieving generalised reorientation using deep RL.

Model-Free Control of Continuum Robots
Control, Machine Learning

Continuum robots are notoriously hard to control, with classical models requiring extensive specialist knowledge to tune.

To overcome this, I used deep learning to model a control system. I captured motion data using a grid search in actuator space, and trained the model to map this to world space. This mapping could then be reused to control the robot.

IoT Hydroponic System for Urban Agriculture
System Design, Cloud Computing, IoT

Developed sensing and actuation system for an urban agriculture to optimise yield and resource use. Used a star network topology with micro-controllers interfacing with a central Raspberry Pi server.

Data was fed into an AWS pipeline for real-time processing. Designed a dashboard using SvelteKit to allow users to monitor system health.

Experience

Computer Vision Engineer Jul 22 - Current
PolyMetrix

First employee of pre-seed start-up, tasked with designing and developing an app to take 3D scans of individuals' faces using an iPhone.

Implemented ICP and Poisson surface reconstruction in Swift to produce an OBJ file accurately and efficiently for use in parametric design of face masks.

Consultant Software Engineer Apr 21 - Sep 21
Cambridge GaN Devices

Led the design and build of automated PCB testing system using Python.

Coordinated instruments to automatically characterise next generation GaN devices saving significant engineering time.

Created UI to allow for granular control of test parameters while preserving standardisation across tests.

Teaching Assistant Oct 19 - Apr 21
Imperial College London

Selected to assist with teaching the first year mathematics module, helping deliver tutorials and giving one-on-one support.

Skills

Machine Learning

Reinforcement Learning (SAC, PPO)

Convolutional Neural Networks (2D & 3D)

Classical Machine Learning (SVM, RF, Regression etc.)

Numerical Optimisation Techniques

Software

Python (incl. Tensorflow, Pandas, SkLearn, Numpy)

Cloud Computing (AWS Lambda, S3, EC2 etc.)

CI/CD with Git

Web Development (incl. TS and SvelteKit)

Photorealistic Rendering (Blender)