

# Chris Vail Software Engineer

## Education

**MEng Design Engineering** 2018-2022  
Imperial College London

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

Proven multidisciplinary engineer with the ability to learn fast and thrive in ambiguous start-up environments. Projects range from advanced robotics to urban agriculture and MedTech

Modules included: Machine Learning, Optimisation, Additive manufacture, Robotics research, Entrepreneurship and Product Design

## Projects

### Procedural Scene Generation for Robotic Disassembly of Waste Electronics

Masters project developing robotic system to complete first stages of disassembly using entirely synthetic training data made using Blender

Photorealistic procedural scene generation pipeline used to train Mask-RCNN and 6D pose estimation models with high accuracy

System was able to localise screw heads to within 1.8mm using only RGB-D images

Used deep reinforcement learning (soft actor-critic) for object manipulation and reorientation

Proposed scalable system for data generation using distributed ledger technology

### IoT Hydroponic System for Urban Agriculture

Founded start up looking at sustainably growing edible plants in underutilised office space

Developed proof of concept automated hydroponic system with cloud monitoring, edge AI and a functional web application

Lead product validation, generating specifications from customer interviews

Created proof of concept pipeline for gauging plant health based on RGB images using Yolo v8

Trained PPO model to control environmental conditions to maximise plant growth

### Model Free Control of Continuum Robots

Trained an LSTM model to predict commands for 12 motors to control a highly non-linear robot in 3D space

Achieved control within 5mm, comparable with advanced classical control algorithms

## Experience

**Computer Vision Engineer** Jul 22 - Present  
PolyMetrix

Computer Vision Lead of sub-millimetre 3D scanning app built in Swift and Rust

Wrote high performance algorithms for 3D point clouds to create a live reconstruction and meshing pipeline on an iPhone

Lead technical discussions with multiple stakeholders to ensure timely product delivery

**Automated Test Engineer** Apr 21 - Sep 21  
Cambridge GaN Devices

Lead the design and build of automated PCB testing system using Python, SvelteKit and AWS

Programmed high voltage testing equipment to automatically characterise next generation GaN devices, reducing engineering time by up to 95%

Created UI to allow variable control of test parameters based on the project, managing conflicting views among stakeholders

**Teaching Assistant** Oct 19 - Apr 21  
Imperial College London

Selected to assist in delivering and refining the first year maths course, effectively communicating complex solutions

Invited to assist marking coursework and providing feedback for a third year robotics module

**Engineering Intern** Oct 17 - Aug 21  
Cable Consulting International

Developed a novel program to simulate transient stresses on high voltage DC cables, to inform the court on a multi-million pound lawsuit

## Skills

Python (inc Numpy, Pandas, OpenCV and Open3D)

Machine Learning (inc PyTorch, SciKit Learn)

High performance software (C, Rust)

3D Modelling / Rendering (Blender)

Web Development (inc. TS and SvelteKit)

Amazon Web Services

Docker

Technical communication (inc Adobe CC)

Human centric design / product development