

PROFILE

A robotics engineer who loves to work with everything from microcontrollers and electronics to SLAM and machine learning. I interned as a robotics engineer at Magazino in Munich and in the Czech Technical University, as well as contributing to the Fat Cat Fab Lab Makerspace in New York. After that, I went on to work full time at Magazino, as well as teaching children robotics and doing contract work as robotics engineer. I also have various personal projects, including a plant-tending robot, an untethered one-legged jumping robot, extrusion of conductive materials, and more. Currently I am studying Engineering MEng at Cambridge.

PORTFOLIO/PERSONAL PROJECTS

- **Monopod** (<https://georgehartt.com/monopod>): An untethered, one legged jumping robot inspired by Marc Raiberts hopper. This project is especially challenging as I have to construct a voice coil actuator for a prismatic joint from scratch. Furthermore, the controls are another area which I am excited about as it involves creating a realistic rigid body simulation of the robot, and using that to test my control code. I am currently pursuing the path of using a genetic algorithm to generate gaits. Pictures of built robot can be seen in the above link.
- **Autonomous Growing Unit** (<https://georgehartt.com/agu>): a robot controlled by an Android app that tends plants. Implemented electronics using EAGLE, and mechanical using Solidworks. Arduino was used for low-level control and RaspberryPi for high-level control, for which I implemented serial communication between the two. The RaspberryPi is controlled by a bespoke Android App via Bluetooth.
- **InMoov** (www.georgehartt.com/inmoov): an open source humanoid robot which I 3d printed and assembled, implemented electronics as well as creating implementing controls and visualisation in ROS.

Other projects can be seen on my website, www.georgehartt.com.

SKILLS

- **Programming:** Python (expert), Java (advanced), C++ (advanced), Assembly (intermediate)
- **Software & Tools:** Linux, ROS 1 & 2, git, Jupyter, Pandas, Docker, pybullet, Kafka, Docker, Stage, ZeroMQ
- **CAD/ECAD:** Solidworks, Inventor, Fusion360, Eagle
- **Hardware:** Atmel, 8051, ESP32, Raspberry Pi, Jetson
- **Languages:** Czech (native), English (fluent)

WORK

Robotics Engineer, Engineered Arts Limited, Remote Freelance, July 2020 - September 2020

- Doing freelance work for a client which involves creating a ROS2 bridge written in C++ which connects to the client's proprietary robot operating system. My responsibilities were writing production ready code and making documentation.

Robotics Software Engineer, BotCraft, Remote Freelance, February 2020 - July 2021

- Doing freelance work for a client which involves creating a robot system architecture in Python from the ground up. In this role I am working autonomously, being the lead of this project. My responsibilities were writing production ready code, creating documentation, making comprehensive unit and integration tests, CI, and more. Working with ROS, Kafka, InfluxDB, and Docker.
- Creating a software stack based on ROS which enables autonomous docking to a charger via the use of a LIDAR. This involved first creating a simulation in Stage and writing a pattern-detector which extracts meaningful features from raw laser scan data using OpenCV. I also wrote a closed-loop navigation stack that is not reliant on Cartographer, but instead uses encoders and the pattern-detector to get sub centimetre localisation.

Robotics Teacher, Building Imagination, London, September 2019 - October 2020

- Teaching robotics to children in schools around London at after-school clubs. Using various robots to explain coding, debugging and hardware concepts.

Robotics Software Engineer, Magazino, Munich, October 2018 - July 2019

Robotics Software Engineer Intern, Magazino, Munich, May 2018 - August 2018

- Calibrating, fixing and operating robot Toru at customer base, writing programs and implementing them to help deployment with Python/C++ in ROS.
- Being lead Software and Deployment for robot Soto, which involved creating a model of the world for the robot, which was then used to execute grasp sequences of boxes off of shelves.
- Worked on SLAM through Google's Cartographer, logging and analysing resource usage on robots, as well as deep debugging implementation in ROS.

Internship at Czech Technical University of Prague, December 2017 - April 2018

- Tasked with 3D printing and assembling open-source robot, InMoov, setting up electronics and writing microcontroller firmware.
- [Challenged myself by implementing controls in ROS](#): creating a Solidworks model, exporting URDF and creating a node which maps joint angles to servo angles and sends them to the microcontroller via Serial.

Internship at Fat Cat Fab Lab Makerspace, New York City, September 2017 - December 2017

- Collaborated on creating a RFID card enabled system to constrain the usage of machines such as laser cutters and CNC mills. Worked on electronics, firmware, UI and back-end.

Network Office Intern, Bacon's College, London, March 2015

- Involved learning of new software platforms and hardware concepts, including network and computer structures.

EDUCATION

MEng		Engineering	University of Cambridge
Ongoing		Modules: Mechanics, Electrical, Materials, CS, Maths, Civil, Thermodynamics	
A Level	A*	Mathematics, Further Mathematics	Bacon's College
2016/17	A	Physics	
O Level	A*	Mathematics, Computer Science, Biology, Physics, Chemistry	Bacon's College
2014/15	A	History, Media Studies	
	B	English Language and Literature, Astronomy, Religious Studies, French	
CMI		Level 2 Qualification in Introduction to Team Leading (Obtained)	