

Jonathan Wang

INFORMATION AND COMPUTER ENGINEER · UNIVERSITY OF CAMBRIDGE

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Education

University of Cambridge

Cambridge, United Kingdom

M.ENG (HONS), ENGINEERING, 4TH YEAR STUDENT

Oct. 2018 - Jun. 2022

- First Year: High 2.i (74%) ; Second Year: Ungraded (As a result of CoVid-19) ; Third Year: High 2.i (71%).
- Specialised in **Information and Computer Engineering and Bioengineering**.
- **4th year Papers:** Machine Learning, Deep Learning, Computer Vision, Robotics, Information Theory, Computational Neuroscience, Bioelectronics, Software Engineering Principles.
- **3rd year Papers:** Signals and Systems, Signal Processing, Information Theory, Inference, 3D Computer Imaging, Molecular Bioengineering, Neuroscience, Mathematics, Marketing, Economics, French.
- **Masters NLP Research Project:** Project involved using natural language processing and machine learning to train a counter speech dialogue system that can respond intuitively to hate speech. Introduced a custom unsupervised evaluation metric using neural networks with associated custom data sets. Fine tuning of state-of-the-art dialogue systems such as BlenderBot was done to create a convincing dialogue system.
- **Multidisciplinary Design Project:** Innovated a way of aggregating metrics in hospitals and care home wards with environmental monitoring systems to distribute a compact live data monitoring system to nurses and other care staff. Established a serial connection between Arduino sensors and a Raspberry Pi, this data was fed into the L2S2 system via Xenplate API to be displayed.
- **Integrated Design Project:** Led the full construction of a minesweeping robot made to detect and move magnetic blocks. Worked primarily on the software side of the project in writing code for the sensors and motor controls in C++. Worked using Arduino environment, interfaced using Wi-Fi to a backend python script running computer vision (OpenCV) algorithms.
- **Machine Learning Self Project:** Built and trained a fully convolutional neural network for image segmentation in PyTorch with Python using standard network architecture involving convolutional and ReLu layers (u-net style). Trained network using training images and plotted associated training loss. Code was used to analyse satellite images and segment the image into man made buildings and natural landscapes. Network could achieve 80%+ accuracy on minimal training data.

Westlake Boys High School

Auckland, New Zealand

HIGH SCHOOL

Feb. 2013 - Dec. 2017

- **A Levels:** Mathematics (A*), Physics (A*), Chemistry (A*), Biology (A*), English Literature (A*)
- **NZQA Scholarships:** Outstanding Scholarships in Chemistry and Statistics, Scholarships in Physics, Calculus, Earth and Space Science, Biology and English

Skills

DevOps AWS, Docker, Kubernetes, Terraform, CircleCI, Snowflake

Robotics Arduino, ROS

Front-end HTML5, CSS, React.js, TypeScript, SASS

Programming Python, C(basic), REST API, LaTeX, Unix, Git

Languages English(Fluent), Shanghainese(Fluent), Mandarin(Professional), French(Beginner)

Experience

HomeX

Cambridge, United Kingdom

APPLIED DATA SCIENCE INTERN

Jun. 2021 - Sep. 2021

- Built a backend API using Python FastAPI and data modelling/machine learning techniques to generate models of statistics about home ownership by geographical location. API was integrated into many existing distributed systems to be used throughout the organisation.
- Built a front-end website using TypeScript and React to develop an interactive website to intuitively demonstrate different statistics using interactive street maps and tables.
- Deployed all these services from scratch using a pipeline involving Docker, Kubernetes and Terraform to generate infrastructure allowing data ingestion from AWS S3 and Snowflake and data serving via Kubernetes pods to a dedicated domain. CircleCI to allow for CI/CD pipeline to allow for deployment automation.
- Authentication of internal services using JavaScript web tokens and Keycloak realms.

EduExperts

Auckland, New Zealand

PRIVATE TUTOR

Jun. 2020 - Oct. 2020

- Private tutor for students studying A level Physics and Mathematics, IGCSE Physics, Chemistry, Biology.
- Gave a conference about study habits and university to an audience of over 50 prospective students.

TUTOR

Aug. 2016 - Apr. 2018

- Mentored and tutored students in subjects such as mathematics, science and English.
- Communicated ideas and supported students of all ages (6 – 18 years old) and backgrounds.

Extracurricular Activity

Cambridge University Robotics Society

Cambridge, United Kingdom

CORE MEMBER

Nov. 2018 - Jun. 2021

- Developed a behavioural and vision system for robots to compete in a football tournament. This involved building out a computer vision framework for the robot implemented using OpenCV in python.
- Designed an optimisation strategy using image pre-processing to increase computational efficiency that reduced computation times by over 100%.
- Collaborated on a behavioural system that optimized the path planning system when the robot is moving into positions. This was computed using trajectory planning and Bezier curves in C++.
- Developed an audio transmission system for the robot rescue major which integrated front-end JavaScript with ROS audio to create a web-based system that could send and receive audio.

Cambridge University Spaceflight Society

Cambridge, United Kingdom

MEMBER

Oct. 2019 - Jun. 2020

- Role in developing the core segment of rocket connecting oxidizer tank and oxidizer i.e., fuel injection mechanism and complementary ground support systems.
- CAD development (Solidworks), 3D printing, laser cutting and machining of parts including oxidizer fuelling line disconnection system and post launch sealing mechanism.

Honors & Awards

2021	College Prize for Engineering , Robinson College	Cambridge, United Kingdom
2019&20	College Exhibition Awards for Academic Achievement , Robinson College	Cambridge, United Kingdom
2017	Proxime Accessit , Westlake Boys High School	Auckland, New Zealand
2017	New Zealand Outstanding Scholars (1 of 50) , NZQA	Auckland, New Zealand
2016	NZ International Chemistry and Biology Olympiad Training Camps , Chemistry and Biology Olympiads	Auckland, New Zealand