Joshua Talks

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Education

Gonville & Caius College, University of Cambridge **2018 – 2022**

BA (Honours) in Information/Computer Engineering and Bioengineering

- First Year (2.1) – General Engineering
- Second Year (Ungraded due to COVID-19) – General Engineering
- Third Year (2.1) – *Modules*: Statistical Signal Processing, Information Theory & Coding, Inference, Molecular Biology, Neuroscience, Medical imaging & 3D Computer Graphics, Mathematical Methods, Signals & Systems, Data Transmission

MEng in Information/Computer Engineering and Bioengineering

- **Masters –** *Modules:* Deep Learning & Structured Data, Computer Vision, Computational Statistics & Machine Learning, Probabilistic Machine Learning, Computational Neuroscience, Biomimetics, Biomedical engineering, Strategic Management.
  Dissertation: **DNA alignment for Molecular Storage**
  - A practical information encoding/decoding system for storing data on DNA has been proposed, combining a technique known as watermark coding with standard DNA alignment tools. Prevalent DNA alignment tools (BLAST, BWA) do not perform well with the increased substitution rate resulting from its use.
  - I aim to investigate how those alignment tools can be modified to cope with an increased rate of substitutions.

Royal Grammar School, Newcastle Upon Tyne **2009 – 2018**

- **A-levels:** Mathematics(A*), Further Mathematics(A*), Physics(A*), Chemistry(A*)
- **IGCSEs/GCSEs:** 10A*, 1A**

Skills

Python (Keras, Scikit-learn, OpenCV, NumPy, SciPy, Pandas, Django), C++, JavaScript, SQL, HTML, CSS, Basic Mandarin

Work Experience

Research Biological Image Analysis, *Oxford Gene Technology (Cambridge)* **Aug 2021 – Sept 2021**

- Evaluating and Implementing Artificial Intelligence Algorithms for single cell flow-FISH cytometry (Fluorescent in-situ hybridization) image analysis used for medical diagnosis of genetic disorders such as Leukaemia.
- Semantic segmentation of image data; literature review and implemented an automatic annotation pipeline combined with a CNN, a semi-supervised loop combing clustering and classification, transfer learning.
- Extensive use of Python utilising Keras, Scikit-learn, OpenCV, Pandas and other Neural Network libraries; StarDIST

Data Engineer Intern, *PragmatIC (Cambridge)* **Jun 2020 – Aug 2020**

- A full stack custom web-based data analysis dashboard, UI providing real time user configurable database queries and interactive visualisations/analysis for in-depth investigation of a database containing millions of entries.
- Worked with Python, Pandas, JavaScript, HTML, SQL, CSS, Django web frame works and Altair plots.

Design/Software Engineer Intern, *Huxley Bertram Engineering Ltd. (Cambridge)* **Jun 2019 – Sept 2019**

- Software Team: Using Python to create an automated microscope inspection rig to detect and identify faults.
- Design Team: Worked with CAD on bespoke automated machinery projects solving a range of design problems.

Projects

Reinforcement Learning Control of Cartpole system **May 2021 – Jun 2021**

- Python simulation of an inverted pendulum, applying reinforcement learning to control the dynamical system.

Implementing a Bayesian Binary Classifier **Mar 2021**

- Building and training a Python based Logistic Classification model using the Laplace approximation, evaluating and optimising its performance through several metrics and tuning of hyper-parameters.

Mine clearing Robot with Computer Vision **Nov 2019**

- Designed and built a robot integrating Mechanical (CAD), Electrical (EAGLE) and software engineering.
- Using C/C++ and Python to code an Arduino based robot that used computer vision combined with IR, ultrasound and hall effect sensors all mounted on a custom chassis to detect, map a route and collect mines.

Two stage Booster Rocket, *Cambridge University Space Flight (CUSF) Society* **Oct 2018 – Jan 2020**

- Student-led team to design (CAD), test and manufacture a two stage Booster dart style rocket.
- Worked in Mechanical sub team on parachute release, fuel regulation and disconnection at launch.

Real time UK Flood warning software project **Feb 2019**

- Python project to create a predictive flood warning system based on real current/past data for English rivers.
- Collaborative project using GitHub and PyTest unit tests for a test-driven development process.