Max Cotton

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Portfolio Webpage: max-cotton.github.io/

I am a Computing Science student with a passion for programming and open-source tools. I love exploring and customising Linux environments - currently running Hyprland with Arch - and staying up to date with the latest developments in Software Engineering. I enjoy mastering all aspects of programming and have a number of examples in my public GitHub account, github.com/max-cotton/. Further details are shown on my portfolio webpage: max-cotton.github.io/. In particular, I recently coded a custom implementation of a load balancer using Go as well as an Artificial Neural Network from first principles, achieving a 96% prediction accuracy on the MNIST dataset.

I am enthusiastic, hard-working and keen to build my experience across all aspects of Software Engineering.

Education

- University of East Anglia (2024 – Current, Due to complete May 2028)
  - BSc (Hons) Computing Science with a year in industry, Predicted 1st.
- Comberton Village Sixth Form (Sept 2022 – June 2024)
  - A-levels: Maths (A), Computer Science(A) and Physics(B)
- Heritage School, Cambridge (Sept 2017 – June 2022)
  - 11 GCSEs including Maths, Computer Science, Physics, Chemistry, Biology, English Literature, English Language, History, Geography, French and Music.

Skills

- Tools: Trello, Jira, Slack, Jupyter Notebook, Git, Github, Docker, Neovim, Makefile
- Programming Languages: Go, Python, Java, C/C++, SQL, TypeScript, Javascript, HTML, CSS, Bash
- Frameworks / Libraries: Spring Boot, Express.js, NumPy
- Operating Systems: Linux, Windows

Experience

Cambridge Consultants - June 2023

Cambridge Consultants, https://www.cambridgeconsultants.com, is a technical research and development company deploying cutting-edge technologies within the Medical and Telecommunications space.

- Placement student working within the Artificial Intelligence team and the Medical software team.
- Worked within Software Development teams, developing prototype systems and Medical AI agentic systems.
- Showed ability to integrate quickly within a fast-moving, established team.

Microsoft Research - July 2023

Microsoft Research, https://www.microsoft.com/en-us/research/, develops and explores future technology platforms within the Microsoft family.

- I worked within Microsoft's cloud-based Azure team, developing and implementing the Azure Confidential Consortium Framework (CCF) - an open-source framework for developing secure cloud-based applications.
- Developed applications using TypeScript within the Azure team, utilising CCF, and used Python to demonstrate and test CCF features.

- Showed ability to come up to speed rapidly with a complex and changing codebase and contribute to testing scenarios.

Hackathon, Institute of Physics, London - September 2023

The Institute of Physics, https://www.iop.org/, coordinates and represents Physics Research within the United Kingdom and has a particular interest in Quantum Computing.

- I took part in an introduction to quantum computing and a hackathon.
- Took part in a team challenge where my team placed first.
- Developed team-building skills whilst having a deep dive into Quantum Computing.

Projects

Custom Load Balancer

- Developed a custom implementation of a load balancer and analyse different load balancing algorithms.
- Utilized GitHub for version control and Jira for setting up a backlog and sprints as part of our agile methodology. I helped develop the core functionality of the project using Go and an extensive use of synchronisation techniques such as mutexes to ensure safe multithreaded programming.
- Implemented health checks on the servers using Goroutines.
- Set up an endpoint for load balancer metrics and analysed different algorithms using Jupyter notebook.
- Provided Docker files and set up a GitHub workflow to run both unit and integration tests as part of the CI/CD.

Sanitation resource IOT People Design Challenge

- Delivered a project to facilitate an increase in access to sanitation resources in a third-world setting. This was implemented through the development of an Internet of Things toilet monitoring system reporting on condition and compost toilet capacity utilisation.
- Utilized GitHub for version control and Trello for following a Kanban board as part of our agile methodology. I implemented all back-end server-side code hosting the website and providing API endpoints to interact with a PostgreSQL database using the Java Spring Boot framework, following MVC architecture.
- Implemented role-based authentication and encrypted password storage.
- Developed teamwork skills alongside tight deadlines.

Website Development

- I worked in a group to design and develop a website to a client specification.
- Utilized GitHub for version control and Trello for following a Kanban board as part of our agile methodology and implemented all back-end server-side code using NodeJs and Express.js, following MVC architecture.
- Implemented web security such as HTTPS and rate limiting.
- Developed teamwork skills alongside tight deadlines.

Developed Artificial Neural Networks from first principles

- Learned and implemented the theory of Artificial Neural Networks using Python with NumPy, without the use of any 3rd party machine learning libraries.
- I also allowed for training and saving of multiple models with custom hyper-parameters via a GUI, as well as experimenting via Jupyter notebooks, and achieved a prediction accuracy of 96% on the MNIST dataset.
- Provided a Docker file and set up a GitHub workflow to run unit tests as part of the CI/CD.

Activities and Achievements

- Duke of Edinburgh Gold Award