Josh Cunningham

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EXPERIENCE

- **Alabama Water Institute (University Of Alabama)**   Tuscaloosa, Alabama, USA
  Software engineer (Research Assistant)   *Sept 2023 - Present*

    I write, review, and package open source python software.

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- **University Of Akron**   Akron, Ohio, USA
  Teaching Assistant   *Aug 2022 - Jun 2023*

    In parallel to my studies, I instruct CS1 Labs, grade work, and tutor students in C++.

- *Research Assistant*   *Jun 2023 - July 2023*

    Designed and manufactured apparatus to run and monitor experiments remotely. I used 3D modelling + printing for mechanical components and a desktop CNC for the custom PCBs I designed.

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STFC SCD Dynamic Infrastructure Group   Rutherford Appleton Laboratory, Harwell, UK
DevOps Engineer and Scrum Master   *Feb 2020 - Aug 2022*

   I streamlined development processes, improved monitoring, and worked with some of the world's leading laser and particle physics research facilities to improve the stability and performance of a novel research platform.

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- **Downtime reduction of 92%**: Once deployed, the projects I lead and developed resulted in a 92% reduction in downtime over 12 months. Mostly attributable to the CICD Pipeline, Configuration Management, and Detailed Monitoring & Alerting.

- **Continuous Integration and Deployment**: I designed and implemented the full CICD Pipeline for the platform, using a combination of DevOps tools and bespoke scripts. This enabled faster, safer releases, allowed for rapid iteration of new features and fixes, and reduced downtime.

- **Configuration Management**: I designed, developed, and deployed the automatic configuration for all of the permanent infrastructure. This allowed for repeatable dev environments, rapid recovery in the case of failure, and allowed horizontal scaling of our applications for the first time (along with some software changes I implemented).

- **Monitoring & Alerting**: I integrated detailed hardware and software monitoring into existing architecture across thousands of cloud machines. The additional information reduced ticket resolution time and allowed more efficient load balancing across resources. I also worked with colleagues to create intelligent alerts to detect incidents before they escalated.

- **Linux module dev**: I developed a new user management system that ties into the existing Linux kernel. This was achieved with a custom NSS module designed to contact a REST API. This removed an active user growth limitation and the overhead of more complex legacy architecture.

- **Data Management**: I advised and worked with research organizations to build software that manages hundreds of petabytes of data over billions of files. The most notable was an archival system that reduced hardware cost 80% by automatically categorizing data and moving it off spinning disk to tape storage.

STFC Scientific Computing Department   Rutherford Appleton Laboratory, Harwell, UK

Computer Science Graduate   *Sept 2018 - Feb 2020*

Before I chose my permanent role, I worked in three departments performing a variety of Software Dev, Sysadmin, Operations, and DevOps work.

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- **SCRUM, Agile methodologies, & sprints**: I was a scrum master for 3 years across different teams, managing effort and balancing priorities with a mixture of Support, Operations, and Development workloads.

- **REST, Containerisation, & Microservices**: I developed a notification service, deployable in docker, that was responsible for brokering messages to users in different forms (email, push notification, etc). Inter-service communication was achieved with Django REST APIs and asynchronous email required integration with a message queue system. I created a prototype docker sidecar and client api to asynchronously add messages to RabbitMQ.

- **Automated Unit Tests, CI & CD**: I wrote thorough unit tests for each service I developed and every service for which I configured the CICD.

- **Linux Systems**: All of my development, deployment, and maintenance work was performed on virtual machines or containers running no gui Linux

- **Web design - infraportal.org.uk**: I designed, created, configured, styled, named, and imported all the survey data into the infraportal, which is the UK's flagship catalog of publicly funded research infrastructure designed to promote collaboration.

Ashfield Healthcare   Ashby-De-La-Zouche, UK

Junior Software Developer   *July 2016 - July 2017*

During my year in industry, I worked for the software team at Ashfield Healthcare. My role responsibilities were diverse, but my most valuable contributions were personal projects, an admin tool I created to speed up ticket resolution and automate arduous business processes.

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- **Admin Tool**: I designed, built, and continuously improved an admin tool later adopted by Three other departments to save time by automating fixes for common help desk tickets.

- **Business Process Automation**: While working support I noticed intermittent errors and delay in the new hire onboarding process. After my investigation revealed the HR system emailed another department who then manually configured accounts, I created a service that would parse the emails and create the accounts automatically.

Programming Skills (in order of proficiency)

- **Programming**: Python3[1], Git, BASH, C, Javascript, C++,C#, Python2, LaTeX

- **Front-end**: HTML, ASP.Net, CSS

- **Back-end**: FastAPI, CherryPy, Django, REST APIs, SQL, MongoDB, SQLAlchemy

- **DevOps**: Ansible, Openstack Cloud, Github Actions, Prometheus, Grafana, Docker, Kubenetes, Linux

Education

- **University of Alabama**   Tuscaloosa, Alabama, USA
  Masters of Computer Science Current GPA 4.0   Aug. 2023 – Present (estimated graduation June 2024)

- **University of Akron**   Akron, Ohio, USA
  Masters of Computer Science GPA 4.0   Aug. 2022 – Aug. 2023 (Transferred to Alabama)

- **University of Leicester**   Leicester, UK
  2:1[2] BSc Computer Science (with Industry)   Sept. 2014 – May. 2018

- **The British School of Brussels**   Tervuren, Belgium
  (A-Levels) (GCSE)   Sep. 2008 – July. 2014

Personal Interests)

- **Machine Learning**: I have a keen interest in deep learning and conducted research using Graph Neural networks to predict the odour of molecules based on structure. I have also been experimenting with OpenAI's gpt API since I got access to it in march. I've been working on a few tools to automatically generate documentation and unit tests for software I've written. I also wrote a utility that suggested tips to improve the CS1 code I was grading. Even after manually verifying correctness it enabled me to provide much more comprehensive and personalised grading.

- **3D design and printing**: I enjoy making and inventing things, from simple organisers to battery-powered handheld solder-feeding tools. To truly refine software I believe in getting a minimum viable product quickly and then iterating over it, fixing the weak points each generation. When making something, the same holds true. 3D design and printing allow me to rapidly prototype ideas until they're both functional and refined

- **Home server**: For my machine learning research I created two compute servers from old liquidated server hardware. I enjoyed the challenge of combining the hardware and getting it running. It also massively reduced the cost of the machines. When not training models I have them run smart home monitoring and a network file system with Elastic search powered full-text search.

- **Quadcopters**: I build, repair and fly First-person racing drones.

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[1]The majority of professional production and personal software I've written is in python3