Dr. Jamie Quinn

Research Software Engineer
Applied Mathematician

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Summary

I am a research software engineer with experience developing mathematical models and scientific codes for the efficient simulation of natural phenomena, particularly geophysical fluid dynamics, and particularly making use of parallelisation on HPC accelerators such as GPUs. Although I prefer to develop in C++ or Python, I have professional experience with Fortran, Zig, Javascript, Elixir and Ruby. I also draw great joy from education and mentoring, having taught a variety of subjects professionally for nearly a decade.

My personal interests include the simulation of geophysical and environmental fluids dynamics, creating generative art, and I also play fiddle semi-professionally.

Experience

Imperial College London (Aeronautics) *Senior Research Software Engineer*; 2024-Present

- Provided guidance on good software practices to department.
- Implemented parallel IO strategies in CFD code x3d2.
- Introduced light-touch agile strategies to better manage various projects.
- Developed local community through social events and coding meetups.

Hydroquo+ *Chief Technology Officer*; 2019-2024

- Designed and implemented scalable cloud architecture for secure sensor-based water quality monitoring.
- Involved in large-scale (1M+ USD) venture capital and industrial project discussions.

University College London (ARC) *Senior Research Software Engineer*; 2020-2024

- Developed open source tools for the manipulation of bathymetry data: pyCascadia.
- Parallelised the quantum chemistry code TROVE, allowing it to run on large-scale HPC systems.
- Contributed novel climate indicators to xclim.
- Led the development of FPGA-accelerated algorithms in statistics and linear algebra.
- Led an investigation into state-of-the-art energy and power benchmarking in HPC.
- Led the redevelopment of the Master's level course Research Computing with C++.

Society of Research Software Engineering *Trustee*; 2021-2023

- Led the membership subgroup, charged with increasing and maintaining membership numbers.
- Led the communications subgroup, maintaining the society's official comms channels.
- Led the EDIA working group, managing the community-led EDIA-focused activities.
- Involved in communications and EDIA strategy development.
- Spearheaded complex migration of membership platform, from scoping through to execution.

Private tutor 2015-2020

- Coached over 50 students in mathematics, physics and computer science.

Beatson Institute for Cancer Research *Mathematical Modeller*; 2019-2020

- Developed a novel mathematical model of the Rac protein in cellular membranes.
- Implemented the model numerically in both 2D and 3D using a finite-element method.

University of Glasgow Students' Representative Council

Postgraduate Convenor, Research; 2019-2020

Postgraduate Convenor, Science and Engineering; 2018-2019

– Elected to represent over 2000 students at the highest level of the university.
– Guided the overhaul of representation structures at the postgraduate level.
– Drafted a new policy document covering the wellbeing of GTAs as part of the GTA Working Group.
– Represented the SRC at the Global Student Leadership Forum in Chengdu, China.

University of Glasgow

Graduate Teaching Assistant (School of Mathematics); 2016-2020

Graduate Teaching Assistant (LEADS); 2018-2019

– Developed teaching materials for courses in numerical methods and conversion to physics.
– Lectured and led tutorials on academic writing, numerical methods, calculus and linear algebra.

Glasgow Guardian *Editor, Science and Technology*; 2018-2019

– Established the Science and Technology section.
– Managed a team of writers in the publishing of award-winning articles.

Pint of Science *Team Leader, Creative Reactions*; 2018

ICHEC, Dublin *Software Developer*; 2017

– Developed a novel rendering code based on radiosity and implemented in C++ and OpenGL.
– Produced videos and blog posts for outreach.

Find a Player *Software Developer*; 2016

– Developed a back-end API written in Ruby and Elixir for a mobile-based social app.
– Administered AWS configuration using Terraform.

Freelance Software Developer; 2015-2016

– Designed web-scraping tools to populate ebook metadata.
– Applied OCR technology to automate the processing of sensitive billing information.

Education

University of Glasgow

Applied Mathematics, PhD; 2021. Thesis: *Modelling anisotropic viscosity with applications in the solar corona*

Mathematics and Physics, MSci; 2016.

– Masters thesis: *Double-Diffusive Convection*
– Honours dissertation: *2D Topological Quantum Field Theories*

Notable Projects

You can find a full list of my personal and professional projects on my website but I am particularly proud of the projects listed below:

Melvin.py is a GPU-accelerated Python code for simulating 2-dimensional advection-diffusion problems.

PyCascadia is an implementation of the remove-restore algorithm for combining bathymetry datasets.

Jacobi Microbenchmark is a numerical solver for exploring optimisations in a variety of languages.