**Jonathan Conder**

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## Profile

Software engineer with expertise in backend development, DevOps, machine learning and systems programming. PhD in Mathematics and BSc in Computer Science.

## Employment

- Software Engineer II at Canonical. **2024–**

  Part of a small team of software engineers working on developer experience tooling.

- Senior R&D Software Engineer at Soul Machines. **2020–2024**

  Part of a small team of researchers and engineers that developed AI models which drove the behaviour of realistic virtual characters. Responsible for two Python services which hosted some of these models, using FastAPI and PyTorch. Contributions:

  - Trained and evaluated models, typically transformers or convolutional neural networks, to perform tasks such as language modeling and object detection.
  - Created and maintained REST APIs which exposed these models to other services.
  - Configured cloud deployments on AWS and Azure using Kubernetes and Terraform.
  - Simplified deployment with Poetry and Docker. Used BuildKit and other techniques to write cache-friendly Dockerfiles. This made typical image uploads over $100\times$ faster.

  Contributed to a large cross-platform codebase, written in C, C++ and Julia. Highlights:

  - Created a high-level library for running TensorFlow Lite models, using C++ and OpenCV. It uses data-oriented design extensively, resulting in it running $4\times$ faster than Google's equivalent, with $100\times$ less variance in processing time.
  - Maintained a Julia fork. Contributed patches upstream whenever possible.
  - Rewrote our C/Julia interface to improve overall performance by 10-15%.

  Improved developer experience by taking the initiative to:

  - Write GitHub Actions in JavaScript to implement CI/CD for Julia and Python code.
  - Simplify and automate builds using CMake imported targets and Conan packages.
  - Implement remote debugging for Julia by creating a VS Code extension in TypeScript.
  - Document code using Documenter.jl, Doxygen and Sphinx.

## Skills

- Quickly understanding and solving problems, in both familiar and new environments.
- Communicating clearly and resolving misunderstandings.
- Working effectively in both independent and team settings.
- Assisting others when needed and helping them grow professionally.

## Education

- PhD in Mathematics (Algebraic Geometry), University of California San Diego. **2013–2019**
- BSc (Honours) in Mathematics, University of Auckland. **2012**
- Conjoint BSc in Computer Science/BA in Mathematics, University of Auckland. **2009–2011**