Michael Rawson

Research Associate

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British National

Brief

From 2017–20 I followed a doctoral program in Computer Science working on adding machine-learned "mathematician's intuition" to computer programs that perform logical reasoning. I am now a research associate.

Education

BA Computer Science, *University of Cambridge*.   **2014–17**

PhD Computer Science, *University of Manchester*.   **2017–**

Employment

Software development intern, *RealVNC Ltd*.   **Summer 2015**

Developed a build script to parse API headers and generate idiomatic Python bindings and documentation for inclusion in the RealVNC SDK. Still in use as of 2020.

Undergraduate research (UROP), *Computer Laboratory*.   **Summer 2016**

Helped with various academic activities. Produced a computer graphics practical course from scratch for the second-year undergraduate programme.

Software development intern, *Redgate Software Ltd*.   **Summer 2017**

Internal systems developer. General development, unit testing and an informal feasibility study of "NoSQL" technology for high-throughput event storage and analytics.

Teaching assistant, *University of Manchester*.   **2017–20**

Teaching assistant for undergraduate and taught postgraduate courses. The role covers a large number of different topics and includes teaching and assessment.

Consultant, *Critical Future Ltd*.   **2018–19**

Part-time machine learning / "data science" client-facing consultant for an industrial project centred around predictive maintenance.

Consultant, *Zenith Choice*.   **Summer 2019**

Brought on to survey and deliver a report on all aspects of information technology use within a startup company. Added significant value for top-level management by communicating technological issues and existing infrastructure design in plain English.

Research Associate, *University of Manchester*.   **Autumn 2020–**

I am a research associate for the *Collaborative Architecture for Proof Search* project. The position allows me to continue using my parallel programming and machine learning skills in a formal-methods context.

Research Interests

I am interested in the application of modern AI techniques to formal methods, and in both of these areas individually. Publications listed on my academic CV.

Skills

I have a broad set of skills related to software systems, with specialisms in:

Machine learning: I apply and evaluate statistical inference methods on various domains in academia and industry. I routinely design, tweak and optimise deep neural network architectures on exotic domains for my research. I have employed reinforcement learning techniques where absolutely necessary.

Symbolic AI: My doctoral research combines the statistical and symbolic approaches to intelligence. In particular my knowledge of practical reasoning systems allows fresh approaches to difficult problems unsolvable otherwise.

Formal verification: My bachelor's thesis deals with interactive formal verification of a branch of mathematics, and my current research can be applied to automatic verification on any domain. I can use industrial-strength tools to argue formally yet concisely within a verified environment.

Programming languages: I am a long-time programming language nerd, and continue to follow advances in modern language design. I'm familiar with the theory and practice of engineering optimising language translators.

Systems programming and optimisation: Tasks in research and employment have required optimisation or careful programming *ab initio*. I can profile and optimise application performance, and program tightly to system interfaces. My current research introduces task parallelism to a large existing codebase.