AARON STOCKDILL

aaron.stockdill@cl.cam.ac.uk · https://aaron.stockdill.nz/

EDUCATION

Doctor of Philosophy, *University of Cambridge, UK*. *In progress* 2017–2020

- Computer Science. Thesis: "Automating representation change across domains for reasoning". Developed a theory of cross-domain *correspondences* to enable user-aware, contextual AI explanations in an interdisciplinary team from Cambridge and Sussex.
- To date, have published one conference paper and one workshop paper, both peer reviewed. Two further conference papers have been accepted for publication. Presented to peers and academic leaders: a one hour seminar for the AI Research Group Seminar Series in the Computer Lab, and a 15 minute Postgraduate Seminar at college.
- Hamilton Cambridge International Scholarship recipient, awarded once every three years; provides full funding and stipend.
- Computing Officer for the Selwyn College MCR Committee, which represents graduate students at the college; I managed the punt reservations, committee elections, and website. In the department, I managed the AI Research Group website.

Bachelor of Science with First Class Honours, *University of Canterbury, NZ*. 2013–2016

- Computer Science honours, GPA 8.9 of 9, 2016. Report: "Neuromorphic Computing with Reservoir Neural Networks on Memristive Hardware". Simulated new hardware to implement faster and more power efficient neural networks.
- Published two peer-reviewed conference papers.
- Double major in Computer Science and Mathematics, GPA 8.83 of 9, 2013–2015.
- Graduating BSc(Hons) Computer Science Student of the Year Prize 2016 recipient, and Graduating BSc Computer Science Student of the Year Prize 2015 recipient, for highest cohort grades.
- Committee member of the Computing Society and Mathematics Society, providing academic support, social functions, and subject promotion. Built the Computing Society website. Helped co-ordinate the eventual merger of these two societies.

EMPLOYMENT

Supervisor, Computer Science, *University of Cambridge, UK*. 2017–2020

- Organised and ran small group teaching sessions for undergraduate students in their first and second years.
- Tailored individual and group work to the students' needs, ensuring my time and feedback was used effectively and targeted to their interests and weaknesses for both coursework and future career.
- Encouraged and moderated group discussions that included all members of the group, ensuring the students were teaching each other as much as I was teaching them; this gave new perspectives to their peers and verified their own understanding.

Lecturer, Computer Science, *University of Canterbury, NZ*. 2017

- Planned then delivered lectures full time in Term 3 for more than 400 students in the 'Introduction to Computer Science' course which covers foundational concepts; in anonymous student feedback surveys I received an average 4.30 of 5 in teaching effectiveness.
- Developed and graded a cohesive, comprehensive three-part assignment, which was delivered and assessed online.
- Worked with students individually both as part of the lab tutor teams and during office hours, the latter allowing me to spend time working with students that otherwise struggle in higher education environments.

Tutor, Computer Science, *University of Canterbury, NZ*. 2015–2017

- Computer-lab-based teaching with groups of 20–80 students across all three years of undergraduate courses, and one postgraduate course; focus on theory and skill acquisition, with assignment guidance and exam preparation as appropriate.
- Developed effective relationships with the students; student surveys of tutor effectiveness provided valuable feedback, and indicated an average 4.83 of 5 overall effectiveness, one of the top results in the department.
- Provided feedback to improve lecturers' effectiveness by observing the students, and then indicating where the challenging points have been in labs to improve the understanding and thus exam scores for students; produced new resources.

Founder, Web Designer, Programmer, *Potato Softworks*. 2014–2017

- Founded Potato Softworks web design and hosting in 2014 with a fellow university student, with the aim of learning how to operate and improve small businesses, including financial responsibilities, legal obligations, and client management.
- Acted as consultant and designer for clients, developing them a web presence to increase exposure, with some clients receiving in excess of 5000 unique visitors in a month.
- When acting in a forward-facing role I brought in more than half of our clients, and continued to work with them to ensure ongoing monthly revenue for the company; positive experiences generated further clients through referrals.

Software Developer Intern, *ARANZ Geo Leapfrog*. 2014–2015

- Worked as part of the software development team working on geological modelling software, learning professional software development, and implementing new features such as a mesh editing interface and automatically generated graphics.

COMMUNITY VOLUNTEERING

STIMULUS Volunteer, *University of Cambridge*. 2018–2020

- Volunteered 90 minutes per week at a local sixth form college, working with the teacher to extend both their knowledge and that of the students, providing extra resources and information, raising their confidence and understanding of computer science.
- Engaged individually with students to provide practical help, extension activities, or alternative explanations, developing and encouraging their passion for computer science and programming.

Scholarship Calculus Coordinator, *Cashmere High School, NZ*. 2015–2016

- Developed the Scholarship Calculus programme for advanced Year 13 students, building on their standard curriculum and producing a set of resources for myself and future teachers running this programme.
- As a result of the new programme and teaching pattern, my 2016 cohort received a record four scholarships, double the previous best record for the school, and helping fund the students' tertiary education.

PERSONAL SKILLS

- **Communication** My work has primarily been in education, where communication to both large groups and individuals is vital. I have strong conflict-resolution skills. I am a native English speaker, have a functional level of French (approximately B1), and am a German beginner (A2).
- **Organisation** I am an organised person, as evidenced by pursuing higher education and starting my own company. Both teaching and my extra-curricular work require extensive planning, while a PhD is an exercise in resource management.
- **Leadership** I ran a company, am responsible for many students, and have organised and run events for MathSoc and CompSoc at the University of Canterbury. I was on the MCR committee for Selwyn College. I am willing to take charge, with the commitment and skills to see a project through to completion at a high standard.
- **Diligence** As a PhD student, I must complete a long-term project with shifting goals. The research is novel, and requires planning, resource management, motivation, and perseverance to bring to conclusion.

TECHNICAL SKILLS

- Specialist in artificial intelligence, principally logical but also statistical; applications range from education to analysis to physics. My research included theoretical proofs, human participant evaluations, and statistical analysis.
- Secondary computer science specialisation in machine learning, algorithms, and data structures; mathematics specialisation in graph theory, algebraic structures, linear algebra, and probability.
- Proficient with Python, Standard ML, HTML/CSS/Javascript, C, and LaTeX. Familiar with APL, C++, Fortran, Haskell, Lisp, and PHP. Others can be learnt quickly. Familiar with standard office software.

PUBLICATIONS

Correspondence-based analogies for choosing problem representations. *Aaron Stockdill, Daniel Raggi, Mateja Jamnik, Grecia Garcia Garcia, Holly E. A. Sutherland, Peter C.-H. Cheng, and Advait Sarkar*, IEEE Symposium on Visual Languages and Human-Centric Computing, 2020.

Dissecting Representations. *Daniel Raggi, Aaron Stockdill, Mateja Jamnik, Grecia Garcia Garcia, Holly E. A. Sutherland, and Peter C.-H. Cheng*, 11th International Conference on the Theory and Application of Diagrams, 2020.

Inspection and Selection of Representations. *Daniel Raggi, Aaron Stockdill, Mateja Jamnik, Grecia Garcia Garcia, Holly E. A. Sutherland, and Peter C.-H. Cheng*, Intelligent Computer Mathematics, 2019.
https://dx.doi.org/10.1007/978-3-030-23250-4_16

Simulating neuromorphic reservoir computing: Abstract feed-forward hardware models. *Aaron Stockdill and Kourosh Neshatian*, 2017 International Conference on Image and Vision Computing New Zealand (IVCNZ), 2017.
https://dx.doi.org/10.1109/IVCNZ.2017.8402482

Restricted Echo State Networks. *Aaron Stockdill and Kourosh Neshatian*, AI 2016: Advances in Artificial Intelligence: 29th Australasian Joint Conference, Hobart, TAS, Australia, December 5-8, 2016, Proceedings, 2016.
https://dx.doi.org/10.1007/978-3-319-50127-7_49

AWARDS

Hamilton Cambridge International Scholarship, *Cambridge Trust*, University of Cambridge. 2017
Full scholarship to study towards my PhD at the University of Cambridge.

Graduating BSc(Hons) Computer Science Student of the Year, *University of Canterbury*. 2016
Awarded for academic achievement throughout my undergraduate and honours study.

G B Battersby Trimble Scholarship in Computer Science, *University of Canterbury*. 2016
Awarded for academic merit, broad knowledge outside of computer science, and research of benefit to New Zealand.

UC Senior Scholarship, *University of Canterbury*, for academic merit at 200 and 300 level. 2016

Allied Telesis Labs Scholarship in Computer Science, *University of Canterbury*. 2015