

Professional & Research Experience

11/2014 — 07/2017

Machine Learning Research Engineer

[Data61, CSIRO \(Formerly National ICT Australia\)](#)

Divisions: Machine Learning Research Group, Engineering & Design

Projects: Big Data Knowledge Discovery under SIEF



- **Development (Lead):** Led design of active learning algorithms using Gaussian processes (GP);
Result: Efficient informative exploration reduced required overall simulation time **from months to just hours**, making scientific discoveries in complex ecological systems feasible
- **Research (Lead):** Designed a mutual differential entropy measure for GP classification;
Result: Applied to informative path planning; Published at *ACRA* and included in *honours thesis*
- **Development (Contributer):** GP **python** library (**PEP8 style**) for active & multiclass learning
- **Research (Contributer):** Bayesian optimisation, AutoML, and scalable approximate inference

*"Kelvin's active sampling work has **made feasible** the simulation work currently undertaken by Ecologists at Macquarie University, which would otherwise cost expensive computing resources and many months in time."* (Link)

-Dr. Simon O'Callaghan, Senior Research Engineer

11/2013 — 02/2014

Software Engineering Intern (Space Science)

[CSIRO Astronomy & Space Science](#)

Project: Astronomical Source Finding – Interactive Data Visualisation



- Developed & released an **interactive data visualisation software** in **python**
Intuitive for analysing radio astronomical data with *Duchamp*
- Produced & released modular parameter tracking software for *Duchamp*
- Collected and reduced astronomical data on my trip to ATCA
Further analysed and deduced inter-galaxy interactions from HI radio emission data

"Kelvin has built a very impressive graphical interface that allows astronomers to make better sense, more quickly, of the results of their Duchamp search. It was a complex task, requiring understanding of the various data structures and strong python programming skills." (Link)

-Dr. Matthew Whiting, Research Scientist (Computing) & Manager

11/2012 — 03/2013

Research Scholar (Medical Physics)

[The Institute of Biomedical Engineering and Technology](#)



- Facilitated research in an emerging medical imaging technology
- Simulated ultrasound response of bio-tissues under magnetic stimulation
- **Verified** the physical processes involved as originally proposed with MATLAB
- **Demonstrated** possibility of performing tumour treatments without direct physical contact

*"He took this project well in his stride, requiring little supervision and assistance. He was **able to solve problems on his own and by liaising with industry supervisors**. In my experience this is fairly rare with engineering students who have not been exposed to research."* (Link)

-Dr. Alistair McEwan, Professor & Research Project Supervisor

Teaching Experience

02/2013 — Now

Tutor

School of IT, AeroMech Engineering, Business Analytics, Mathematics & Statistics (University of Sydney)



- **Dean's Faculty Award Winner for Outstanding Tutoring 2017**

See Award Recommendation and anonymous student feedback on my [LinkedIn](#)

- **100% positive evaluations in anonymous student surveys since 2013** (extremely rare) — Main comments: Clear presentation, engaging style, friendly personality, empathetic listener
- Taught courses at both undergraduate and postgraduate level in Machine Learning, Data Science, Statistics, Software Engineering, Systems Engineering, Space Engineering, and Risk Management (See my [LinkedIn](#) for detailed list)

*"Since 2013, Kelvin has always had a very high quantity of strong and enthusiastically positive comments, **without a single negative comment at all**. Even amongst the excellent standard of tutors, this suggests to me that **Kelvin is one of the best tutors of all time, even better than previous tutoring award winners**."* ([Link](#))

-Dr. Jason Chan, Course Coordinator & Lecturer

Education

2016 — 2019

Doctor of Philosophy (Machine Learning)

University of Sydney & Data61, CSIRO



- Advisors: Fabio Ramos (Sydney University) & Richard Nock (ANU & Data61, CSIRO)
- **Best Student Paper Award Winner** at *European Conference on Machine Learning 2018*
- Experienced in: Approximate Bayesian inference, likelihood-free inference, kernel methods, kernel mean embeddings, hyperparameter learning, Gaussian processes, active learning, Bayesian optimisation, variational inference, neural networks, and deep learning

2011 — 2015

Bachelor of Engineering (Mechatronic & Space Engineering) & Bachelor of Science (Advanced Mathematics and Statistics)

University of Sydney

Graduated with **University Medal and First Class Honours**



Achievements & Awards

- **University Medal** and First Class Honours, awarded to the **highest achieving graduate**
- University of Sydney Academic Merit Scholarship & Prize (every year)
- Dean's List of Excellence in Academic Performance (every year)
- Top 3 Presenter for Honours Thesis (2015)
- Aside from Honours, also graduated under Advanced Engineering Stream (2015)
- First place in several units of study

Projects

- UAV (Drone) Safety Subsystem with Startup *Flirtey* (2014)
- CubeSat Development under QB50 regulations; Lead Presenter at *AIAA* (2014)
- Project Leader in Star Tracker Development with PIC18 microcontroller (2014)
- Research Leader in Physics Talent Program on Solar Energy (2014)
- State and National Finalist in Engineers Without Borders Challenge (2011)

Miscellaneous

Python Libraries: tensorflow, torch, keras, numpy, scipy, matplotlib, seaborn, pandas, sklearn, etc

Languages: Python, MATLAB, R & RStudio, SQL, C

Hobbies: You can find me busking on the streets of Sydney on weekends with our acoustic band. I sing and play the guitar and keyboard. We also perform at weddings, cafes, and various social events.