

Professional & Research Experience

- 09/2019 — Now **Senior Data Scientist** [Boston Consulting Group \(BCG GAMMA\)](#)
- Drove conceptualisation, development, and productionisation of novel solutions and frameworks for clients using Bayesian contextual multi-armed bandits, reinforcement learning, hierarchical Bayesian inference, optimisation, and simulation
 - Led development of core library and simulator for a proprietary reinforcement learning package
- 06/2018 — 08/2019 **Consultant, Data Science** [Westpac Banking Corporation](#)
- 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*
- **Research (Lead):** Led design of 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 an **interactive data visualisation software** for radio astronomical data in **python**
 - Released modular parameter tracking software for *Duchamp*
 - Inferred inter-galaxy interactions from HI radio emission data personally collected from *ATCA*
- "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](#)
- **Verified** ultrasound response of bio-tissues under magnetic stimulation via dynamic simulation
 - **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 — 07/2019 **Tutor** [School of Computer Science, Aerospace, Business Analytics, Mathematics, Statistics \(University of Sydney\)](#)

- **Dean's Faculty Award Winner for Outstanding Tutoring 2017** (*See Award Recommendation*)
- **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 and anonymous student feedback)

"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](#)
Thesis: *Bayesian Perspectives on Conditional Kernel Mean Embeddings*
Research Areas: Bayesian inference, likelihood-free inference, kernel mean embeddings, Gaussian processes, active learning, Bayesian optimisation, variational inference, and deep learning

2011 — 2015 **Bachelor of Engineering (Mechatronic & Space Engineering) (Advanced Stream) & Bachelor of Science (Advanced Mathematics and Statistics)** [University of Sydney](#)
Graduated with **University Medal and First Class Honours**

Achievements & Awards

- The **University Medal** is awarded to the **top highest achieving graduate** (first place)
- University of Sydney Academic Merit Scholarship & Prize (every year)
- Dean's List of Excellence in Academic Performance (every year)
- First place in several units of study and Top 3 Presenter for Honours Thesis

Projects

- Project lead for motion tracker development; Research lead for solar energy efficiency
- Developer for a drone safety subsystem with *Flirtey*
- Developer for a CubeSat system under QB50 regulations; Lead presenter at *AIAA*

Publications

Hsu K. & Ramos. F, "Bayesian Deconditional Kernel Mean Embeddings", *International Conference on Machine Learning (ICML 2019)*

Hsu K. & Ramos. F, "Bayesian Learning of Conditional Kernel Mean Embeddings for Automatic Likelihood-Free Inference", *International Conference on Artificial Intelligence and Statistics (AISTATS 2019)*

Hsu K., Nock R. & Ramos. F, "Hyperparameter Learning for Conditional Kernel Mean Embeddings with Rademacher Complexity Bounds", *European Conference on Machine Learning (ECML-PKDD 2018)*, **Best Student Paper Award Winner**

Hsu K., O'Callaghan S., Reid A. & Williams S., "Informative seafloor exploration using the linearised differential entropy of Gaussian process classifiers", *Australasian Conference on Robotics and Automation (ACRA 2015)*

Professional Services

Program Committee & Expert Reviewer for International Conference on Machine Learning (ICML'20-21)

Program Committee & Reviewer for Conference on Neural Information Processing Systems (NeurIPS'20-21), International Conference on Learning Representations (ICLR'22), and Symposium on Advanced in Approximate Bayesian Inference (AABI'19-20)