

Robert C. Williamson

Education

Bachelor of Engineering (Electrical), Queensland University of Technology 1984

Master of Engineering Science (Electrical Engineering), University of Queensland 1986

PhD (Electrical Engineering) University of Queensland 1990

Academy Fellowship

Fellow, Australian Academy of Science (elected in 2012)

Fellow, Australian Mathematical Society (elected in 2016)



Career Summary

- **Distinguished Researcher** Data61 (2017 – 2020)
- **Chief Scientist** Data61 (2015 – 2017)
My role was to oversight and evaluate all the research in Data61 and to set the overall scientific direction of the organisation (via the Data61 science vision).
- **Research Program Director (Analytics)** Data61, (2015 – 2016)
This was a line management role; I looked after approximately $\frac{1}{4}$ of the research staff of Data61. The Analytics program subsumed the NICTA Machine Learning Research group (and was approximately triple its size).
- **Acting and then Interim CEO** NICTA, (2015)
I was responsible for the overall running of NICTA for the first half of 2015, during the complex merger with CSIRO.
- **Research Group Leader** Machine Learning, NICTA, (2011 – 2015)
Rated in 2014 by independent international review as amongst the top 5 machine learning research groups in the world (next to Berkeley, Cambridge, Microsoft Research, and Max-Planck Institute for Autonomous Systems).
- **Visiting Researcher** Microsoft Research, Cambridge (2010)
I visited the Online Services and Advertising team.
- **Scientific Director** NICTA (2006-2010)
My role was to oversight and evaluate all the research in NICTA and run the internal project selection processes. I also had to present the organisation's research regularly to the international scientific advisory board, and to various stakeholders. I designed and ran the promotions process for all technical staff.
- **Visiting Researcher** Max-Planck Institute for Biological Cybernetics (2006)
- **Founding Canberra Lab Director** NICTA (2002 – 2006)
I co-wrote the bid for NICTA and helped create the institution. NICTA grew to 700 people strong and received over \$600M in funding and engaged in a wide range of end-user driven research with

significant impact. NICTA very substantially raised Australia's international profile in information and communications technology research.

- **Professor (E2)** Research School of Computer Science, ANU (2012 – 2020)
Undergraduate teaching in information theory. Extensive mentoring and PhD student supervision. Lead author on school strategic plan (2018).
- **Head** Computer Sciences Laboratory, ANU (2008 – 2009)
- **Professor** Computer Sciences Laboratory, ANU (2006 – 2011)
- **Professor** Department of Telecommunications Engineering, ANU (2001 – 2005)
- **Lecturer, Senior Lecturer, and Reader** Department of Engineering, ANU, (1990 – 2000).

I was the 2nd academic appointed to the new engineering program at ANU and played a very significant role in the development of the department, developing the culture, the curriculum, recruiting staff and students. I developed 7 new courses from scratch, and developed new teaching laboratories in subjects such as Electrotechnology, Analog Electronics, Digital Electronics, Microprocessor Systems, Signals and Systems, and Analog and Digital Communications.

- **Lecturer** Department of Electrical Engineering, University of Queensland (1989)

Experience Highlights

- I am a **fellow of the Australian Academy of Science**; I have the reputation to be able to engage with the scientific elite of the world. I have 30 years' experience as an active researcher.
- I am an **experienced research leader**. I created and lead the Machine Learning group in NICTA which was independently rated as amongst the best 5 in the world. Former members of the group rate their time there as the highlight of their career.
- I have a **very broad perspective on technological innovation**. I led the team and expert working group that prepared the report [Technology and Australia's Future](#) through the 4 learned academies for the chief scientist of Australia. This multi-year project was the largest and most complex of the Securing Australia's Future projects. I have thus learned how to manage complex multi-stakeholder projects and deliver on-time and under budget.
- I have a **broad exposure and experience in world class research organisations**. In addition to ANU, NICTA and Data61, I spent 9 months at Microsoft Research, Cambridge, and 4 months at the Max-Planck Institute for Biological Cybernetics. I was formerly a member of the Scientific Advisory boards of *National Institute for Informatics* (Japan) and *Max-Planck Institute for Biological Cybernetics*.

Scientific Contributions

I have developed scientific theory and widely used practical algorithms to solve machine learning problems. My [recent work](#) has focussed on [reconceiving machine learning](#) by understanding relations between machine learning problems. Most recently I have refocussed my efforts onto the theoretical foundations of ethical machine learning.

- I have written over [200 papers](#), which have been [cited](#) nearly 20000 times.

- I have graduated more than 20 PhD students.
- I have received 10 Australian Research Council grants (9DP, 1 LP)
- I served on program committees for major Machine Learning conferences (NIPS, ICML, COLT); Program Chair for COLT 2001; President of the association for computational learning (which runs COLT) 2002—2004. Co-organised multiple NIPS workshops. Workshops co-chair for NIPS/Neurips (2008 and 2019); Tutorials Chair for Neurips (2020)
- I was a member Australian Research Council expert Advisory Panel, 2002-2004.

Selected Publications

- [Information, Divergence and Risk for Binary Experiments](#), *Journal of Machine Learning Research*, 12:731-817, 2011 (with Mark Reid)
- [Mixability is Bayes Risk Curvature Relative to Log Loss](#) *Journal of Machine Learning Research* 13:1639-1663, 2012 (with Tim van Erven and Mark Reid)
- [Fast Rates in Statistical and Online Learning](#), *Journal of Machine Learning Research*, 16(Sep):1793–1861, 2015 (with Tim van Erven, Peter D. Grünwald, Nishant A. Mehta, and Mark D. Reid)
- [Elicitation and Identification of Statistical Properties](#), in Conference on Learning Theory 2014; *Journal of Machine Learning Research (Workshop and Conference Proceedings)* 35:482-526, 2014 (with Ingo Steinwart, Chloe Pasin and Siyu Zhang)
- [The Geometry of Losses](#), in Conference on Learning Theory 2014; *Journal of Machine Learning Research (Workshop and Conference Proceedings)* 35:1078-1108, 2014
- [The Cost of Fairness in Binary Classification](#), Proceedings of FAT*2018 (Fairness, Accountability and Transparency), *Proceedings of Machine Learning Research*, 81:107-118, 2018. (Winner of best technical contribution award.)

Contact

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