



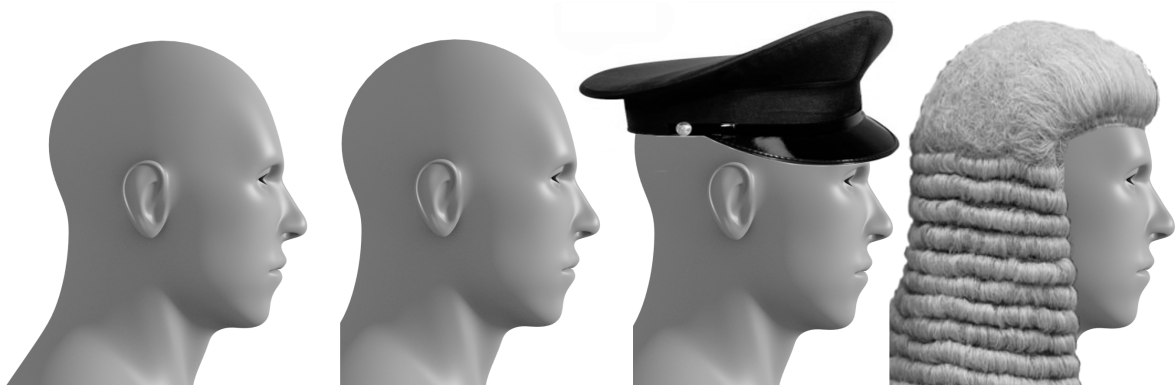
UNIVERSITY
of
OTAGO
Te Whare Wānanga o Ōtago
NEW ZEALAND



Roundtable on Uses of Artificial Intelligence in the New Zealand Criminal Justice System

College of Education, Conference Room
University of Otago
Dunedin

December 11-12, 2017



Artificial Intelligence (AI) systems are increasingly widely used within the field of criminal justice. Police forces use AI systems to predict crime hotspots, to identify individuals at risk, and to assist on-the-ground policing and detective work. AI systems are also used in the courts, to gauge a defendant's risk of reoffending, and inform bail, sentencing and parole decisions. Similar systems are in use in prisons, to inform rehabilitation programmes.

While statistical systems have been in use in criminal justice for many years, the systems coming into use now are increasingly sophisticated, and are finding a variety of new roles. Their increasing prevalence raises many questions. How should the accuracy of these systems be measured? How can we ensure their operation is not biased towards particular social groups? How can we inspect the processes through which they reach a decision? How should human decision-makers interact with such systems? What ethical and legal frameworks do we need to ensure good practice in the use of such systems?

Many of these questions arise wherever AI systems are used to inform decision-making, whether in public policy or by the companies who shape our experiences on the internet. But the decisions made in the criminal justice system have a particularly large impact on people's lives: so the use of AI systems in these decisions demands particularly urgent attention.

We have recently organised a roundtable in Oxford, to gauge current UK/European thinking on these topics. The Oxford meeting brought together lawyers, policy researchers, AI technologists, statisticians, ethicists and police officers, for a wide-ranging interdisciplinary discussion. The NZ roundtable will involve a similarly interdisciplinary discussion - but our aim is to focus some of this discussion on the New Zealand context. Specifically, what AI/predictive systems are currently in use in the New Zealand criminal justice system? How are these systems currently regulated? If additional oversight is needed, what mechanisms in New Zealand might be used?

The roundtable will be structured into four sessions.

- **Orientation:** an overview of how AI techniques are used in policing and the criminal justice system.
- **Validation and assessment techniques:** how should AI systems used in criminal justice domains be evaluated, to ensure we have confidence in them?
- **Fairness and bias:** what sorts of bias might be present in existing AI systems in the criminal justice domain? How can we reduce the biases that exist? Are there any ways in which AI systems can be used to reduce human biases in the criminal justice system?
- **Assessment and standards:** how should the auditing criteria for AI systems in criminal justice relate to those governing other government statistics organisations?
- **Regulation and accountability:** what mechanisms might we put in place in New Zealand to ensure good practice in all of the above areas?

AI and Law in New Zealand—Roundtable Dunedin 2017

Date: 11-12 December, 2017

Location: College of Education Conference Room, 145 Union Street East, Dunedin

Monday, 11 December

ORIENTATION

12 – 1 pm

Introduction

Colin Gavaghan

Associate Professor of Law, Otago

Alistair Knott

Associate Professor of Computer Science, Otago

James Maclaurin

Associate Professor of Philosophy, Otago

Lunch (provided)

VALIDATION AND ASSESSMENT TECHNIQUES

2 – 3.15 pm

Evaluating the Strength of Criminal Justice Forecasting Models in Philadelphia, Durham, Hampshire, and Beyond: The Importance of Applying Costs to Forecasting Errors

Geoff Barnes

Director of Criminology, Western Australia Police Force

Affiliated Lecturer in Evidence-Based Policing, Cambridge

[2 – 2.30 pm]

Discussion

[2.30 – 3.15 pm]

3.15 – 4.30 pm

The accuracy and utility of risk assessment tools

Maaïke Helmus

Lecturer in Psychology, Victoria University of Wellington

[3.15 – 3.45 pm]

Discussion

[3.45 – 4.30 pm]

Tea and coffee

4.45 – 6 pm

Advanced Analytics and its Use in Government: A question of Trust and Value

James Mansell

Independent Consultant, Data Science, Noos Ltd

[4.45 – 5.15 pm]

Discussion

[5.15 – 6 pm]

Tuesday, 12 December

FAIRNESS AND BIAS

9 – 10.15 am

Designing fair predictive tools

Sam Corbett-Davies

Ph.D. Candidate, Stanford University

[9 – 9.30 am]

Discussion

[9.30 – 10.15 am]

Tea and coffee

10.30 – 11.45 am

Biases in data gathering in the criminal justice system, and their effect on predictive systems

William Isaac

Ph.D. Candidate, Michigan State University

Open Society Foundations Fellow

[10.30 – 11 am]

Discussion

[11 – 11.45 am]

Lunch (provided)

ASSESSMENT AND STANDARDS

12.45 – 2 pm

What standards should we apply when assessing the performance of predictive tools deployed in New Zealand?

Len Cook

Families Commissioner and Chair of Superu Board

Former NZ Government Statistician and UK National Statistician

[12.45 – 1.15 pm]

Discussion

[1.15 – 2 pm]

REGULATION AND ACCOUNTABILITY

2 – 3.15 pm

A method for building and evaluating predictive systems in social services

Tim Dare

[2 – 2.30 pm]

Associate Professor of Philosophy, Auckland

Data Ethics Advisor, Ministry of Social Development

Discussion

[2.30 – 3.15 pm]

Tea and coffee

3.30 – 4.30 pm

Ideas for regulatory mechanisms

Colin Gavaghan

Associate Professor of Law, Otago

Alistair Knott

Associate Professor of Computer Science, Otago

James Maclaurin

Associate Professor of Philosophy, Otago

Close

SPEAKERS

Geoffrey Barnes is the first-ever Director of Criminology for the Western Australia Police Force. He also holds a concurrent appointment as an Affiliated Lecturer in Evidence Based Policing at the University of Cambridge, supervising students in the Police Executive Programme who are seeking their M.St. in Applied Criminology and Police Management. He has both led and participated in multiple randomised controlled trials, while also performing work on the actuarial forecasting of future criminal behaviour, the development of crime and anti-social behaviour over the life course, and the use of cost incentives to promote better outcomes for children in foster care. His research interests also include the use of restorative justice and cognitive behavioural therapy with criminal offenders, the effects of swift and certain sanctions on illegal behaviour, the connections between criminal justice involvement and mortality, and the employment of large data sets derived from official government systems.

He earned his Ph.D. in Criminology from the University of Maryland, and was elected a Fellow of the Academy of Experimental Criminology in 2011. Prior to joining the faculty at Cambridge, he held previous appointments at the University of Pennsylvania, University of Pittsburgh Medical Center, University of Maryland, and Australian National University.

Len Cook has been the Families Commissioner and Chair of the Board of Superu since July 2015, a New Zealand crown agency operating as a “what works” centre. Superu has had a strong involvement in lifting the evidence based used by NGOs, developing standards of evidence, and understanding the nature of cultural capital. From 1992 to 2000 he was Government Statistician of New Zealand, after working in Statistics New Zealand in a variety of roles from 1971 to 2000. From 2000 to 2005 he was National Statistician of the United Kingdom. He has been “Friend of the Chair” for the regular meetings of Pacific Chief Statisticians for the last 5 years. His longstanding interests are in the areas of population change and public policy, public administration, official statistics and the place of science in policy.

Len graduated in Mathematics and Statistics from Otago in 1971. He is a life member of the Population Association of New Zealand and the New Zealand Statistical Association, and an elected Companion of the Royal Society of New Zealand. He also holds honorary academic appointments at VUW Institute of Policy Studies, AUT, Otago University School of Medicine and NIDEA.

Sam Corbett-Davies is a Fulbright scholar and Ph.D. student in computer science at Stanford University. Originally from Hawke's Bay, he studied engineering at the University of Canterbury before moving to Stanford. Sam's research applies machine learning and statistics to policy questions. He is currently studying what it means for an algorithm to be fair, especially in the context of risk assessments in the criminal justice system.

Tim Dare is an Associate Professor of Philosophy at the University of Auckland. He worked briefly as a lawyer before doing his PhD in the philosophy of law and starting his academic career in the early 1990s. His publications include books and articles on the philosophy of law, legal ethics, immunisation programmes, the significance of judicial disagreement, parental rights and medical decisions, the proper allocation of the burden of proof, and the use of predictive analytics in child protection. He is employed to provide data ethics advice to New Zealand's Ministry of Social Development and has carried out ethical reviews of a number of predictive risk modelling tools in use in New Zealand and the US. He sits on a number of local and national research and clinical ethics committees.

Colin Gavaghan is an Associate Professor in the Faculty of Law at the University of Otago. He is the first director of the New Zealand Law Foundation sponsored Centre for Law and Policy in Emerging Technologies. The Centre examines the legal, ethical and policy issues around new technologies. To date, the Centre has carried out work on biotechnology, nanotechnology, information and communication technologies and artificial intelligence. In addition to emerging technologies, Colin lectures and writes on medical and criminal law. He is a member of the Advisory Committee on Assisted Reproductive

Technology and the Advisory Board of the International Neuroethics Network. He was an expert witness in the High Court case of *Seales v Attorney General*, and has advised members of parliament on draft legislation. He is co-convenor of the AI and Society discussion group at Otago, and co-investigator in the AI and Law in New Zealand project.

Maaïke Helmus focuses on offender risk assessment. Virtually every decision that is made impacting offenders (e.g., laying charges, bail, sentencing, prison security classification, treatment recommendations, parole, community supervision intensity and conditions) is influenced by some kind of assessment of the offender's likelihood of reoffending. Criminal justice decisions tend to be most efficient and most effective when resources are allocated based on risk to reoffend; specifically, higher risk offenders need higher intensity resources (more treatment, more supervision). So how can we maximize the objectivity/fairness and the accuracy of these risk assessments?

Maaïke is interested in a wide variety of topics related to assessing recidivism risk and changes in risk among offenders. This also includes understanding individual risk factors for recidivism, and understanding the construct validity of risk factors and risk scales. Her research has focused on sex offenders, but she also does research on risk assessment with domestic violent offenders, Indigenous offenders, female offenders, and general offenders. Maaïke also conducts research on issues related to improving offender risk communication (e.g., how can we best communicate the results of risk scales), assessing changes in risk over time, how best to structure risk assessments (e.g., the role of professional judgement and overrides), how to develop/validate predictive models, and other statistical issues in predicting recidivism and measuring the accuracy of risk scales. Lastly, Maaïke is also interested in meta-analyses, both in conducting them and in discussing how to improve meta-analysis techniques.

William Isaac is a Ph.D. candidate in the department of political science at Michigan State University where he studies American politics and public policy. He is a 2017 Open Society Foundation Fellow and currently serves as Research Consultant to the Human Rights Data Analysis Group (HRDAG). His research focuses on the intersection between technology policy, human, and civil rights, with a specific focus their potential ramifications on underrepresented communities. William's previous research has been featured in *Science*, *Nature*, *USA Today*, and the *Wall Street Journal*.

Alistair Knott is an Associate Professor at the Department of Computer Science in the University of Otago, New Zealand. He studied Psychology and Philosophy at Oxford University, then took an MSc and PhD in Artificial Intelligence at Edinburgh University. Ali has worked in AI for 25 years, focussing on models of natural language processing, human-computer dialogue and neural models of language and memory; he has published over 100 papers on these topics. He also works for the Auckland-based AI startup Soul Machines, where he is implementing the embodied model of language developed in his book *Sensorimotor Cognition and Natural Language Syntax* (MIT Press, 2012). He is co-convenor of the AI and Society discussion group at Otago, and co-investigator in the AI and Law in New Zealand project.

James Maclaurin is an Associate Professor in the Department of Philosophy and Associate Dean for Research in Humanities at the University of Otago. His MA in biological applications of mathematical information theory is from Victoria University of Wellington and his PhD in the philosophy of science is from the Australian National University. His research focuses on the relationship between science, public policy and ethics. His books include *What is Biodiversity?* (with Kim Sterelny, University of Chicago Press) and *A New Science of Religion* (with Greg Dawes, Springer Science). He has also published on philosophical methodology and on the application of evolutionary science in economics and in computer science. He has a long-standing interest in the use of information technology in higher education, in which context he convenes the University of Otago's Information Technology Advisory Committee which advises the Vice Chancellor on the university's use of new information technology. He is co-convenor of the AI and Society discussion group at Otago, and co-investigator in the AI and Law in New Zealand project.

James Mansell is a data science activist. He was the thought leader and champion of “Social Investment” and introduced Advanced Analytics (predictive modeling) first into child protection, then Ministry of Social Development, then Treasury for a whole of government approach to investing in long run outcomes. More recently he introduced the same approach into New Zealand Tax agency (IRD) for the “productive sector” and supported a large increased investment and roll out of new advanced analytics capability in IRD.