

Go8 AI Collaboration and Commercialisation Summit – outcomes and summation

Melbourne: 31 October 2019

Introduction

The Go8's invitation-only AI Collaboration and Commercialisation Summit brought together major Government participants, industry (including SMEs), Go8 universities and investors, to discuss what an AI future means for Australia and Australians as the nation works to build its essential AI foundations.

The Summit addressed three key topics: Improving Australia's AI commitment; Improving AI deployment into the economy and society; and Australia's AI policy, governance and regulation.

There were 116 guests.

Government recently committed \$29.9 million to assist prepare Australia for AI - including an AI Ethics Framework, a Roadmap, and Standards. The Go8 Summit was a forum to also discuss the increasing business and universities activity as they develop, and adopt, AI.

The Summit heard from:

Dr Alan Finkel, Australia's Chief Scientist; Professor Toby Walsh, UNSW Scientia Professor of Artificial Intelligence; Professor Jean Chambaz, President of France's Sorbonne University and Chair of the League of European Research Universities and Dr Stefan Hajkovicz, CSIRO's Senior Principal Scientist Strategy and Foresight and Director Data61 Insight Team.

Panellists included Australia's Human Rights Commissioner, and representatives from Standards Australia, IBM, KPMG, the Australian Federal Police (AFP), and AI startup Hivery.

Guests also saw the UNSW Soccer Robots in action under the guidance of Professor Claude Sammut, UNSW Professor of Computer Science and Engineering and Head of Artificial Intelligence Research Group, and two UNSW engineering students Tripta Kaur and Ethan Jones.

Executive Summary

Dominant themes included how human trust in AI can be engendered and importantly maintained; ethical implications of AI; and industry and human utilisation of AI.

The Summit discussed the significant investment by other leading economies and jurisdictions, and the possible ramifications of this for Australia.

There was comprehensive discussion that Australia should still take time to consider social, human and legal AI implications; even as AI advances and investments by other countries intensify.

The Summit demonstrated Go8 AI research capacity, as well as the Go8's practical approaches, and record of deploying and implementing AI.

It was recognised that the Go8 can take the lead in broader discussions; that its social scientists are as vital as its technical specialists in their contribution to ensuring AI is better understood and managed.

There was strong agreement that the Go8 has a key role in advancing AI knowledge and technology, and in educating society and industry about any potential AI ramifications; working with agencies such as the Australian Human Rights Commission, CSIRO Data61, and Standards Australia.

Specifics included:

- Targeted preparation of Go8 graduates, such as through student experience complexity ie data science combined with other streams such as at Monash, and having more disciplines' intersecting. Also seen as vital was the Go8's role in developing and graduating 'human engineers'.
- Go8 experts collaborating on how the relationship between AI and humans evolves. What decision points should remain with humans, and which can transfer to AI?
- Go8 experts' potential involvement in the development of AI accreditation systems with relevance to Australia.
- Contributing to better decision making; providing strategic insights and analysis. This includes where AI impact and uptake should be evaluated and re-evaluated.
- Contributing to information on how key issues, including ethical and legal considerations, are anticipated and treated.

Summit Outcomes

There was robust discussion (to continue) on AI's ethical, legislative and social implications, and how these considerations influence AI's adoption and development.

Trust as a key to how AI is received and/or accepted was critical.

What AI role could Australia have? It was concluded that Australia could contribute considerably, even if it neither follows nor leads overall.

Australia could carve a global niche in AI ethics, supported by the Go8.

Within Australia, in addition to AI technology and knowledge developments, it was proposed the Go8 could take an educative and awareness building role, ie by helping individuals and organisations transition to AI.

The Summit itself provided a forum to connect prominent and new AI experts and groups.

Next Steps

The Go8 will continue to contribute through its universities and via the Go8 Directorate in practical and policy AI considerations, including:

- Ongoing participation in and contribution to the Australian Government's evolving AI agenda
- Discussions with agencies such as Standards Australia and Data61 CSIRO on joint interests and activity
- Connecting Go8 expertise with targeted areas of concern or opportunity

Keynote addresses:

Australia's Chief Scientist Dr Alan Finkel AO

Quotes

'By integrating AI into the broader fabric of our university curricula, we can generate advances of unlimited potential in all fields, building the workforce and industries of the future. I am counting on you to be the leaders in turning this vision into a reality and furthering the goals, aspirations, and moral principles of our society.'

'while AI shows us how it can be of immense service to humanity, it cannot show us how to prevent its immoral use'

Dr Finkel discussed the ramifications for humans of AI's further advances, noting that ethical questions mean AI cannot rely on scientists alone.

He shared his views on the future of AI and what role Australia should or can have, including his belief that it is a false dichotomy to suggest Australia either as a leader or a follower.

Researchers and academics have a role to play in ensuring AI is developed with benefits to individuals firmly in mind, and to cultivate the necessary skillsets including in businesses and workers.

Dr Finkel stressed AI innovation cannot be allowed to disregard human rights, and an opportunity lies in this challenge for Australia to create world leaders in the field of AI ethics and human rights.

Dr Finkel's speech 'Harnessing the power of artificial intelligence to benefit all' is available: <https://www.chiefscientist.gov.au/news-and-media/harnessing-power-artificial-intelligence-benefit-all>.

Professor Toby Walsh, Scientia Professor of Artificial Intelligence, UNSW Sydney

Quotes

'It's hard to know what China or the US are investing in this space but it's in the tens of billions'

'In 2017, PwC estimated that AI will grow the world's economy by over 15 trillion dollars in inflation adjusted terms by 2030 ... it's like we are uncovering a new continent, the continent of AI'

'Australia is well placed to take advantage of this technological change, especially the Go8 universities'

'Further development of AI must be directed to ensure society becomes what we would like it to be'

'Successful development will require a broad range of skills with enhanced capabilities that span the arts, humanities, social sciences as well as STEM'

Professor Walsh drew on his work as co-Chair of the ACOLA Horizon Scanning report, *The Effective and Ethical Development of AI*, released in early 2019.

He spoke of the substantial AI investments by many countries, including the United States, China (in the tens of billions), Germany (€1.3 billion plan), the United Kingdom (£1 billion sterling sector), France (€1.5 billion plan), and India (close to \$500 million).

He said the benefit will not be evenly spread. However, while the comparative impact on the Australian economy at around 10 percent was less than China's 25 per cent, around half of all economic growth in Australia may come from AI and related technology in the next 10-15 years.

There are significant AI economic benefits to be capitalised in Australia, based on its highly educated workforce, a strong research community – including Go8 world leading expertise in many areas of AI – and an active startup sector, across areas like mining, fintech, and agritech where Australia leads the world.

Earning public trust through communication will be vital, as will strong governance and a responsive regulatory system. Access to datasets and new skills will be needed. Implementation will require education programs that start in early childhood and continue – lifelong learning.

However, to call it an AI race was misleading; with a relevant comparison being the development of electricity which benefited some innovators at the time, but is now pervasively beneficial.

Professor Walsh’s presentation is available here:

Professor Jean Chambaz, President of France’s Sorbonne University and Chair of the League of European Research Universities

Professor Chambaz spoke of AI’s importance, and Europe’s efforts to develop a comprehensive AI strategy over the past few years, including the navigation challenges of reaching agreement with some 27 States which have different national policies. The four dimensions considered – with key progress in the last three – are:

1. investment
2. AI societal impacts
3. an ethical framework
4. protecting the sovereignty of the State, or of Europe, or of people

Professor Chambaz noted the importance of trust and social responsibility, with legal frameworks required to protect rights; an area the EU was very good at. However, free research and innovative solutions should not be overly hampered by such frameworks.

With massive data available, there are sovereignty challenges to be addressed – data should be open as much as possible, but closed where needed. Increasing graduates’ data literacy was very important, and this also needed to be built across disciplines.

Sorbonne University took its own approach, to create a Centre for AI, building on its strengths as the university which is number seven in global rankings for mathematics (after Princeton), and given that in France, when Centres of Excellence are discussed, universities are not usually considered.

Professor Chambaz also noted the French President Emanuel Macron’s ambition to have a French AI strategy, and his recent announcement - re an AI forum with Canada – made while launching a global forum for AI for humanity¹.

¹ The announcement, made on 19 November 2019, is to create a standing forum – involving government, industry and academia – to monitor and debate the policy implications of AI globally. Other countries will be invited to join as the French and Canadian “core” develops the plan (<https://sciencebusiness.net/news/france-and-canada-move-forward-plans-global-ai-expert-council>)

**Dr Stefan Hajkowicz, CSIRO Senior Principal Scientist Strategy and Foresight
and Director Data61 Insight Team**

‘If you can know there is a strong potential of evil use for your AI, you should be expected to do something to manage this’ Dr Stefan Hajkowicz

‘\$86 billion publicly disclosed investment worldwide – add to this \$10 billion’ Dr Stefan Hajkowicz

Dr Hajkowicz provided a contextual view of Australia’s AI direction versus global trends. This included the AI Ethics Framework and an AI roadmap for Australia that CSIRO Data61 had been commissioned to deliver. (Both have now been released by the Australian Government).

He stated much was happening in Australia despite the lack of large investment, which globally is led by the US and China. Germany is focussing on niche areas, with Chancellor Angela Merkel reported as saying ‘When you get German AI, you get good AI’.

In Australia, there are deep AI capabilities in CSIRO and Go8 universities in many different fields. The Australian Research Council (ARC) invests in basic research into AI².

Focusing on what AI can do for Australia is the subject of the AI roadmap, with its goal of returning productivity rates to ‘where they were’ using AI. As with electricity, AI is an industry in itself, and also underpins every other industry.

- A ‘who’s who in the zoo’ would help identify Australia’s collective AI capacity
- AI can be adopted when it reaches a certain stage of development and before fully fledged – ie Australia does not need to wait for fully autonomous vehicles when semi-autonomous vehicles are claimed to reduce accident rates and pedestrian mortality

AI must be developed ethically in Australia. International ethical issues and cases demonstrate why human intelligence is required in AI’s development and deployment, such as the case of Houston teachers sacked on the recommendation of an AI algorithm. Privacy and consent issues arise over data, as with the UK’s National Health Service (NHS) provision of 703,000 private records to AI company DeepMind without specific consent. Yet human error can be as challenging - Israeli parole judges making decisions that varied depending on how close they were to morning tea or lunch.

The AI Ethics Roadmap has a range of principles:

- to generate net benefits
- do no harm
- regulatory and legal compliance privacy protection
- transparency
- fairness – if bias goes in, bias will go out
- contestability
- accountability

² AI Roadmap is published at <https://data61.csiro.au/en/Our-Research/Our-Work/AI-Roadmap>

AI can provide the opportunity for a massive upgrade to ethics. AI can also help reduce the negative impact of human biases. One area where the Go8 can contribute expertise is in marrying AI with decision making.

University/external collaboration case studies

Two case studies of external collaboration with Monash demonstrated very different examples of AI development and use

- The practical experience of how AI startup Hivery, a company focussing on AI to assist with vendor analytics came to be and grew through the strong partnership of academia with industry; with discussion of how AI techniques and access to industry data contributed to the company's formation. This provided insights into the many challenges that can face a small company grappling with demand versus resources and growing as a hi-tech organisation while meeting customer commitments. Discussion ranged from data empathy, the constant need for human involvement in AI, and the additional skills needed, such as critical and creative thinking in addition to specific STEM expertise.
- How Monash University and the Australian Federal Police (AFP) created a partnership to assist the AFP identify child abusers. This resulted in the establishment of the "AI for Law Enforcement and Community Safety (AiLECS) research laboratory". The case study demonstrated how the collaboration grew organically from a Monash PhD student Janis Dalins, an AFP officer, being convinced by his employer to join his machine learning studies and his work to translate data into operational effectiveness. The case demonstrated the complexity of AI use, with its moral and ethical issues. The beneficial use of AI to minimise negative impact on AFP personnel by reducing the need for "human hours" examining child abuse material was clearly set out.

Panel Discussions

Improving Australia's AI commitment

Quotable quotes

'many companies claim AI, but excel macro is not AI' Dr Mike Molinari, Managing Director, IP Group Australia

'you can't patent linear algebra' Mr Nick Therkelsen-Terry, CEO and Co-founder, Max Kelsen

'We need to invest in creation and translation – the highest possible quality we can find – linked coherently with the huge opportunities of translation for the nation' Dr Tony Lindsay, Director STeLaRLab Lockheed Martin

Several opportunities that Australia could capitalise on were discussed, as were many specific problems that AI can solve. Further partnerships must be built to reinforce Australia's creation (research discovery) strengths, and to connect these more to translation.

Specific opportunities or areas for improvement included:

- Universities further improving commercialisation and translation capability and performance. This could include creating commercial value by combining AI with other existing or novel solutions.
- AI researcher focus
 - investigating and developing solutions for small data problems and developing new techniques and solutions in areas where there are quite modest amounts of data
 - using AI to improve outcomes in specific disciplines
 - focussing first on a specific data set (such as rainfall data) then developing a general solution or models from this.
- Better preparing graduates and workforce needs solutions
 - providing experience complexity for students
 - using and optimising talent in the context of what is available globally
 - growing talent in areas that companies might recruit for AI – not necessarily computer scientists; rather graduates with a grounding in statistics, mathematics, physics, and data science – on which rigorous internal industry training can build.

It was recognised that:

- it took time to build the talent needed and effort must be invested over a longer period to do so, or the default is to recruit from overseas. A converse challenge is that many companies can only recruit and train so many graduates, so there is a limit in the pipeline
- fundamental research and science is valuable and cannot be downplayed or insufficiently supported
- communication and other skills are also needed; to explain the technology and to link it to individual benefit consistent with community values
- constraints on obtaining data are a barrier (e.g. to make meaningful machine learning models) that can impact how far Australia can mature technology

Improving AI deployment into the economy and society

Quotable Quotes

‘trust not a requirement but an opportunity’ Professor Anton van den Hengel, Director of The Australian Institute for Machine Learning, Chief Investigator of the Australian Centre of Excellence in Robotic Vision, and Professor of Computer Science, University of Adelaide

‘people trust even without having met the pilot or checked their qualifications for flying the plane’ Professor Anton van den Hengel,

‘trust is about the willingness to be vulnerable which we generally do on good evidence.’ Professor Nicole Gillespie, KPMG Chair in Organisational Trust and Professor in Management & KPMG Chair in Org Trust, School of Business, University of Queensland

‘trust is always contextual’ Professor Sarah Pink, Professor and Director of the Emerging Technologies Research Lab, Monash University

Deployment and AI adoption was discussed chiefly from the perspective of trust in AI. The nature of trust and people’s propensity or otherwise to rely on technology was explored, with commentary that trust is not necessarily fixed (e.g. trust in autonomous vehicles can change) and humans trust, more or less, in certain technology or situations.

- regulation can foster people’s trust, for example in Australia, that planes will be safe
- repeatability is another factor contributing to trust – a reliance that what happened last time will happen next time (even though inputs are never the same)
- the good evidence on which people trust has not yet been built for AI
- for some, trust in AI is balanced by the option of trusting the next best thing – a human. The likelihood is that people will trust AI systems over humans, in time
- how humans make decisions cannot be fully diagnosed – human processes are based on familiarity rather than validity

A danger is that Australia will be left behind unless trust issues are properly considered and addressed. Public trust must be engendered. If no one buys an autonomous vehicle because they can't trust it, the product is sunk before the issues can be examined.

Part of the issue around AI trust is centred on the data. In some cases, as with the US system COMPASS which predicts recidivism, but is seen to be inaccurate especially in its assessments of African Americans versus Caucasians, the system is simply following the data, pointing to the need for more fulsome and accurate data. The system pointed to discrimination already in the system.

More work can be done including Go8 experts examining how the relationship evolves between AI and humans. This includes whether humans trust the motives of those behind the AI (the example of Cambridge Analytica was discussed); competing with AI ("It's taking away my job"); how AI adoption takes account of or treats vulnerabilities; and how education plays a part – and can further contribute – in teaching people about the marks of trustworthiness. Go8 experts could also take a role

Australia's AI policy, governance and regulation

Quotable quotes

'the risks are real and insufficiently focussed on' Edward Santow Australia's Human Rights Commissioner

'there should not be a specific regulator for all AI' Edward Santow Australia's Human Rights Commissioner

'let's not enact more laws but map and see where the problems are in order to address them' Professor Jeannie Paterson, Professor of Law, University of Melbourne

'automated decisions may not lead to any more unfairness than humans making decisions' Dr Jed Horner Strategic Advocacy Manager Standards Australia

The imperative to strengthen Australia's regulatory environment to encompass AI's adoption was the focus.

A new body, such as an AI policy council, was not necessarily needed, nor was a specific AI regulator. However, given that AI is not static, and there may be unintended consequences, Australia must be able to manage complexity.

- a first principle is that the law be complied with. The legal framework exists in Australia, although fragmented and with some gaps to be addressed – such as surveillance laws diversity; unfamiliarity with automated decision-making; and how an AI decision could be 'unpacked' if needed

- how the different regulatory structures can provide assistance is another important aspect. Existing regulators must gain the skills and capacity to deal with AI
- responsible AI standards are required to ensure principled AI approaches
- an ethical framework can help navigate difficult ethical questions, where the law is silent and appropriately silent
- while it is incorrect to characterise an AI failure or issue as an ethical problem, ethical standards need to resonate with the community and be workable within industry

A risk-based approach to AI, acknowledging that some AI issues will be more important than others, may be needed. Continual evaluation and examining the implications of AI is needed.

The Go8 can contribute

- to better decision making through their strategic insights and analysis
- to ensuring sufficient time and effort is taken to examine and consider the issues so that the model is robust and not a 'minimum viable product'
- educative capability ie the development and graduation of 'human engineers'

ends