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GETTING AI RIGHT: AUSTRALIAN-EUROPE COLLABORATION POTENTIAL TO MAXIMISE AI BENEFITS FOR SOCIETY

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Recommendations

Moving forward, Australia and the EU should consider the following areas for collaboration:

- * Supporting the dialogue
- * Joint research and monitoring of AI developments
- * Inclusion and empowerment
- * Education and training
- * Regulation
- * Further research and critical discussion

SUMMARY

As artificial intelligence (AI) technologies are increasingly used across converging technologies, they become ever more difficult to manage and predict. This convergence is not just about technologies but also about the breaching of industry boundaries such as those between media, transportation, entertainment, and retail. While this may create an abundance of new products and services, it may also lead to undesirable consequences.

Australia and the European Union are taking the first steps to ensure the ethical development of AI. Each jurisdiction is working to create principles for AI development and application, and, where necessary, AI regulation. Australia and the EU not only share many of the challenges, but also many underlying ethical values. Australia and the EU are excellently positioned to collaborate in this domain. This includes: research into AI technologies and their implications for society; the exchange of good practices on exploiting AI for innovation while maintaining ethical principles, such as data ethics; and collaboration in AI regulation.

INTRODUCTION

With more than four decades of research history, artificial intelligence cannot really be called a new technology – neither as a concept nor as a set of tools and techniques realising AI systems. However, the recent convergence and pace of change makes AI difficult to manage and predict. This convergence is not just about technologies but also about the breaching of industry boundaries. Technology firms (e.g. Alibaba, Amazon) hybridise traditionally siloed services such as media, transportation, entertainment, and retail. While this may create an abundance of new products and services, it

could also lead to market distortion and undesirable social consequences, for example “winner-takes-all” phenomena driven by firms that are best positioned to drive AI.

This raises the following questions. How can we ensure that AI is designed respecting ethical principles? How can we do this while creating an efficient environment for AI-based business to flourish? And, how do we deal with the looming job displacement and labour market impacts that will land in the (not-too-distant) future? In short, many governments, including those in Australia and in the European Union, aim to combine technologically enhanced AI solutions with ethical principles, be it: data ethics; fair, impartial, and bias-free decision making; or safety and security.¹

The promises and potential gains of AI technology have resulted in a worldwide race for domination. The dominance of some large enterprises in AI research and AI tools also means that smaller nations are no longer merely competing with one another but also with firms. As much of AI is about machine learning, this race is often perceived as a race for data, including personal data. This poses many ethical questions and the possibility of regulatory intervention. The challenge is all the greater as the technologies in question are still developing and understanding how AI can be best used for everyday life is difficult. Although the gloomy predictions of some economists about massive job losses may not come true immediately, it is necessary to consider key challenges resulting from AI such as: changes in skills and the workforce; data for AI; and legal aspects, including, for example, automated decision making. Finally, the question of how to best regulate a new technology such as AI is particularly important for international collaboration and indeed may itself pose a need to collaborate internationally.

¹Cf. <https://www.cigionline.org/articles/global-race-ai-how-do-we-ensure-were-creating-better-world>

INTERNATIONAL AI POLICY

Since 2017, many countries around the world have developed national artificial intelligence policies and strategies in which AI technology, the digital economy, data, and the future of work often appear as priorities. However, international discussions have also shown that designing such systems requires an understanding of values and basic principles. During the EPIC events in all three target countries, it became very clear that no nation on its own can claim to have completely addressed the required ethical considerations and that more discussions, and indeed more research, are needed.

The Group of Twenty (G20) has published guiding principles for using AI and on trusted free-flow of data.² It calls for human control, shared benefits, fairness, and inclusion in AI; and it emphasises accountability, transparency, security, and privacy. The G20 thus recognises the need for international efforts to develop a global ethical framework for AI. Such principles should avoid the misuse of AI, or even intentional use for immoral purposes, such as surveillance programs used to identify and suppress dissent. In a similar direction, G7 countries are working on principles for the future of AI, e.g. the Charlevoix vision.³ The Institute of Electrical and Electronics Engineers (IEEE) also describes guiding principles.⁴

A recent white paper by the Australian Human Rights Commission and the World Economic Forum calls for stronger governance and leadership in AI ethics.⁵ Australia's national research organisation CSIRO prepared a discussion paper on AI ethics that is currently under review.⁶ The development of an approach to AI based on trust is a key element in Australia's report on its tech future.⁷ Trust is also a key component in Europe's AI approach in an EU Commission Communication.⁸

In summary, many Australian and European policy papers agree on

the importance of trust as a prerequisite to ensure a human-centric approach to AI: the need to ensure accountability and responsibility, while at the same time harvesting social and business opportunities as much as possible.

Addressing all these constraints with practical policies is a huge challenge and many aspects lack a solid research underpinning. From labour impacts, to questions of autonomous decision making, from privacy concerns, to security of AI, more research is needed in areas such as technology, legal and social work, regulation, and many others.

INITIATIVES ESTABLISHED IN AUSTRALIA & THE EU

Europe has started early in developing an ethical approach to AI. The EU AI ethics guidelines for trustworthy AI were designed as a first checklist for its member states.⁹ Many of its recommendations are already aligned with principles that are mentioned in Australian papers, studies, and government reports. These include:

- * Empower and protect humans and society
- * Foster a data economy
- * Exploit the role of the public sector: ensure sector leads, e.g. with human-centric public services
- * Nurture education: ensure a wide skills base through education and striving towards a work-life-train balance in continuous learning

The European Commission suggests that a European approach should be utilised to safeguard human dignity, transparency, and democracy, and to make sure that AI will have benefits for all business and citizens, whilst also bringing "our society forward together". In Australia, a new report on its 'Tech Future' emphasises how all Australians should be able to engage with technology and participate in a mod-

ern economy. In parallel to the ethical aspects, the European Commission has prepared a plan to considerably invest in AI technologies. First initiatives have been started already in the current EU Framework Programme H2020 and more actions are planned during the forthcoming next programme 'Horizon Europe'.¹⁰ Among the initiatives, the intention to create a vibrant European network of AI excellence centres stands out.¹¹ Other initiatives include: Digital Innovation Hubs throughout Europe; improved training, including PhD programmes; world-reference testing facilities; and public leadership in AI, including the use of public data. The EU plan for AI also emphasises the need for international collaboration and the alignment of member states' bilateral policies.

Research

Australia and Europe have numerous excellent research groups at various universities. Australia is internationally renowned for its work on large, autonomous systems, for example, those used in mining. Europe has a solid tradition in autonomous robotics. Both countries are traditionally strong in logic and constraint programming. Europe's industry is increasingly focussing on embedded AI based on its competence in integrated (embedded) systems. Australia has strong AI applications in health based on initiatives at the federal and state level.

The Australian Government committed AUD \$25 million in additional funding for AI in its Cooperative Research Centres (CRC) Program. CRC-Ps are short-term, industry-identified and industry-led collaborative research projects to develop a product, service, or process that will solve problems for industry and deliver tangible outcomes. The department (DIIS) recently announced funding for 13 centres from a dedicated AI focus from the 2018-19 budget. They range from applications in wastewater treatment to health and agricultural applications.¹²

²https://www.g20-insights.org/wp-content/uploads/2018/07/TF1-1-11-Policy-Briefs_T20ARG_Towards-a-G20-Framework-For-Artificial-Intelligence-in-the-Workplace.pdf

³https://www.international.gc.ca/world-monde/international_relations-relations_internationales/g7/documents/2018-06-09-artificial-intelligence-artificielle.aspx?lang=eng

⁴https://standards.ieee.org/content/dam/ieee-standards/standards/web/documents/other/ead_general_principles.pdf

⁵Australian Human Rights Commission, World Economic Forum. Artificial Intelligence: governance and leadership. White paper, January 2019.

⁶Dawson D. and Schleiger E., Horton J., McLaughlin J., Robinson C., Quezada G., Scowcroft J., and Hajkowicz S. (2019) Artificial Intelligence: Australia's Ethics Framework. Data61 CSIRO, Australia.

⁷<https://www.industry.gov.au/sites/default/files/2018-12/australias-tech-future.pdf>

⁸European Commission. Building Trust in Human-Centric Artificial Intelligence. COM(2019) 168 final. https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=58496

⁹<https://ec.europa.eu/digital-single-market/en/news/eu-artificial-intelligence-ethics-checklist-ready-testing-new-policy-recommendations-are>

¹⁰https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=56017

¹¹<https://ec.europa.eu/digital-single-market/en/news/h2020-call-european-network-artificial-intelligence-excellence-centres-information-and>

¹²<https://www.business.gov.au/Assistance/Cooperative-Research-Centres-Programme/Cooperative-Research-Centres-Projects-CRC-Ps/Current-CRC-P-selection-round#crpc6>

Australia is excellently positioned in some areas to demonstrate AI showcases, in particular in public sector fields. It is a leader in open government data and ranks second out of 49 countries in the 2017 Global Open Data Index. Similarly, Europe has many initiatives aiming to improve public data access and the European Commission has been instrumental in guiding the member states towards more open data policies.

Example #1

Human Factors in AI research

French CNRS and French maritime technology, shipbuilding, and energy company Naval Group, have signed a Letter of Intent with Flinders University, the University of Adelaide, and the University of South Australia to develop a proposal to base what would be one of only five industry-linked CNRS international joint laboratories in the world, in Adelaide. The lab would be positioned at the intersection of autonomous systems, artificial intelligence, and human factors.¹³

Example #2

AI & Data Science

The University of Sydney's multidisciplinary Centre for Translational Data Science¹⁴ and The Alan Turing Institute,¹⁵ the UK's national institute for data science and artificial intelligence, have signed a Memorandum of Understanding to collaborate on joint research projects. These will include criminology, air quality, and geosciences that will have strategic importance to the Australian economy. The collaboration will be centred around The Alan Turing Institute's Data-centric Engineering Programme.¹⁶

CURRENT STATUS & RECOMMENDATIONS

There is a risk that the promised global race for harvesting the economic benefits of AI may limit international cooperation; potentially also between Australia and the EU. However, in some areas such as AI impacts, AI ethics, and AI regulation, international collaboration is the key to success. Only few AI strategies focus on inclusiveness, citizens' rights, trust, human rights, social justice, peace, welfare, devel-

opment, and environmental sustainability. Australia and the EU are well positioned to coordinate work in these areas.

Both the research/engineering and the policy/social side demand such cooperation and dialogue to remain at the forefront of the dramatically fast developments in AI technology, tools, and applications. It is vital to build an appropriate knowledge base in AI technology as well as its social and political implications.

Australia and the EU can build on a skilled labour force but may be facing shortages in key digital skills including artificial intelligence and robotics. As the demand for digital skills is increasing globally, policies of attracting skilled labour from abroad may become less effective. Industrialised nations should join efforts in developing their skills base or as a minimum share experiences, exchange good practices, and provide each other access to online training resources.

In the past, collaboration of individual researchers between Europe and Australia has functioned well. Based on contacts of individuals and a strong expat presence in both countries, AI researchers in Australia and Europe have been working together for decades. On the downside, there have been very few successful joint initiatives going beyond such peer-to-peer activities. EPIC thus recommends the following areas for collaboration:

#1 Supporting the dialogue

- * Develop a global repository of AI strategies and policies to ensure greater transparency and accessibility to the general public and relevant stakeholders, such as policy makers. Such a repository should include the status of implementation and the level of international alignment.
- * Develop a governance structure or platform for ensuring accountability and transparency in the development of AI, in particular as it relates to the social and political impacts of these technologies.
- * Europe and Australia should better utilise their expat networks in both regions. A thematically focused

network (e.g. in ICT) would help to exploit synergies and go beyond current networks often limited to EU member states, for example. This could also improve inter-sectorial exchange if it includes industry and academia.

#2 Joint research & monitoring of AI developments

- * Encourage greater knowledge sharing between Australia and the European Union and its member states to foster a more collaborative environment. Mutual invitations and consultations can be a useful instrument, as can improved inter-country and interdisciplinary exchange in AI engineering and research with scholars in other fields such as law, political science, and humanities.
- * Maintain the opportunities for peer-to-peer collaboration with support for exchange visits and smaller-scale research collaboration opportunities.
- * Improve information about mutual funding opportunities. There are currently many small programs, e.g. of EU member states, that are only short-lived, and it is difficult to maintain an overview.
- * Create opportunities for Australian and European actors to collaborate on development and implementation of a global ethical framework for AI and related emerging technologies.
- * Align long-term research - including 20 years out challenges such as in computational neurosciences.
- * Invest in studying and comparing the social, ethical, political, and environmental implications of AI, in addition to its security and economic implications.

#3 Inclusion & empowerment

- * Include diverse stakeholders in the development of AI policies and strategies.
- * Promote global-level dialogue and cooperation between engineers, researchers, and artists while at the same time increasing local awareness through exhibitions, round tables, and other formats open to broad public interaction.

¹³https://www.unisa.edu.au/Media-Centre/Releases/2019/first-australia-france-joint-international-research-lab-to-be-based-adelaide/#.XSiWTXvqp_A

¹⁴<https://sydney.edu.au/data-science/>

¹⁵<https://www.turing.ac.uk/>

¹⁶<https://www.turing.ac.uk/research/research-programmes/data-centric-engineering>

* *Inform industry about the potential benefits of art/science interaction for innovation and the early adoption of new technologies. These advantages range from the creation of durable artworks that support sustained dialogues to the power of artists to co-create innovation in cooperation with citizens and novel feedback loops from artistic interaction with citizens to research.*

#4 Education & training

* *Include AI training in all computer related education and training courses. Develop accessible, comprehensive education curricula that ensures interdisciplinary understandings of AI and its impacts on society, to enable citizens to make informed decisions in their use of AI and other emerging technologies.*

* *Exchange good practices in AI education for the young, for teachers, and a broad public. Where applicable, this should include citizen science and art/AI initiatives.*

* *Collaborate in content creation, best-practice exchange and sharing of access to online training courses for AI – at the vocational and university level.*

#5 Regulation

* *Establish processes to exchange concepts, practices, and experiences with regulation. For example, Australian researchers are already using existing ISO standards to show potential regulation of automated (including AI) systems.*

* *Develop and share fit-for-purpose and technology-neutral regulatory approaches that strike the balance*

* *between safeguarding the community and enabling new technology innovation.*

#6 Further research & critical discussion

* *Support research to improve our understanding of the social impact of AI including its potential contribution to innovation.*

* *Promote opportunities for exchange between researchers, artists, engineers, and a broad public in order to detect and address adverse effects as well as opportunities.*

* *While Europe has a long tradition of data and IT ethics regulation based on human rights, other jurisdictions focus on different principles such as property rights. It is recommended that Australia and the European Union share investigations of frameworks that best support citizen rights while enabling industry innovation.*

CONCLUSION

Australia and Europe are active contributors to AI innovation. Europe is excellently positioned for its use in embedded and cyber-physical systems and Australia has developed impressive large-scale AI applications. However, they are also faced with global challenges and competition. Neither Europe nor Australia possess large AI firms that currently dominate the AI tool base internationally. However, both regions share many values and the fundamental belief that AI requires an ethical approach. General synergies between Australia and the European Union are evident: strong cultural ties, joint initiatives, common languages and policy interests, but also similar challenges and changes.

Europe and Australia should therefore work closely on both the technology and policy fronts to ensure an ethical, inclusive, and trusted approach to the further development and regulation of artificial intelligence.

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