



Australian Government  

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Australian Research Council

House of Representatives Standing  
Committee on Employment, Education  
and Training inquiry into the use of  
generative Artificial Intelligence (AI) in  
the Australian Education System

# ARC Submission



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## **ARC Submission**

### **Introduction**

The Australian Research Council (ARC) welcomes the opportunity to provide a submission to this inquiry into the use of generative Artificial Intelligence (AI) in the Australian education system.

This submission provides brief context on some of the risks, opportunities and challenges in the use of generative AI tools in the research sector, and particularly in relation to research grants administration. It focuses on three key issues:

- authorship and intellectual property in the use of generative AI tools by applicants in grants application process
- information security and confidentiality risks, and obligations of assessors regarding the use of generative AI tools in the peer review assessment process
- research integrity obligations in the conduct of research more broadly for researchers and research institutions.

### **About the ARC**

The ARC is a vital component of Australia's innovation and research system providing approximately 7% of Government's annual investment in research and development. We play an integral role in supporting the research sector to produce high-quality and impactful research through the delivery of the National Competitive Grants Program (NCGP) which is providing \$895 million (in 2023-24) to research projects, training and infrastructure.

The NCGP comprises a range of complementary schemes under the Discovery Program and Linkage Program to support researchers at different career stages, build Australia's research capability, expand and enhance research networks and collaborations, and develop research training hubs and centres of research excellence. Through the NCGP, the ARC has supported a significant body of high-quality research relating to AI (see summary at [Appendix A.](#))

Our broader remit includes the provision of high-quality research policy advice, overseeing the Australian research ethics and integrity framework, the national university research evaluation system that promotes excellence in research and its engagement and impact, providing grants services to other agencies, powerful data assets and our role in fostering research quality, translation and impact.

### **Generative AI in the research sector**

Use of generative AI within research presents opportunities as well as risks. Some of these have already been identified – many more are to be discovered. A known opportunity includes the analysis of very large datasets, for example relating to drug discovery and astronomy. Generative AI also has the potential to accelerate the scientific method, such as by generating large sets of hypotheses that can be rapidly tested. This could have applications in many fields where the use of high-throughput robotics is routine, for example in the discovery of new materials or antibiotics. Generative AI can also provide assistance in summarising and refining text in order to increase readability, thereby streamlining the scientific writing process, and in particular literature review. In each of these use cases and more, review and testing of AI-supported output is necessary to ensure the validity, accuracy and appropriateness of the material generated.

Risks in the use of generative AI in research include IT security, intellectual integrity and property protection, biased, inaccurate or unoriginal output, and the loss of confidential information. For example, for the majority of the currently available generative AI tools, information entered online can be accessed by unspecified third parties.

### **How the ARC has responded to developments in generative AI tools**

The ARC has in place a range of frameworks and policies regarding responsibilities and obligations of individuals and research institutions in engaging with the ARC's grants programs, and also in the conduct of research more broadly. These frameworks and policies are relevant to understanding the potential risks and challenges presented by generative AI tools, as well as setting expectations around who should be managing these risks and how. More detail on these is provided within our responses to Inquiry Term of Reference Issue 3, below.

We have supplemented these frameworks and policies with specific advice on the use of generative AI in our grant programs, released on 7 July 2023. The ARC's [\*Policy on the Use of generative AI tools in the ARC's programs\*](#) includes guidance to applicants and peer reviewers on the use of generative AI tools with consideration given to various information security and confidentiality risks of using generative AI, and obligations under research integrity frameworks.

Advancement in generative AI technologies, and applications of those technologies, are expected to continue emerging at a rapid pace, creating almost endless possibilities in a wide range of domains. These developments will give rise to new considerations – both positive and challenging. Noting the domestic and global conversations about the opportunities, ethical use and potential regulation of generative AI, the ARC is engaging with our counterparts nationally and internationally to support potential refinements and adaptations to our policies and approach, in line with continually evolving understandings of best practice.

**Inquiry Terms of Reference Issue 3 – The risks and challenges presented by generative AI tools, including in ensuring their safe and ethical use and in promoting ongoing academic and research integrity.**

*ARC Comment*

Issue 1: Authorship and intellectual property concerns

Generative AI tools use algorithms and pre-existing data to produce new content, such as text. The information generated by these tools is often not verified, may not be factual, and may reinforce biases present in the design, build and training data of the models. Using generative AI tools to generate text and passing that off as original could undermine the norms around authorship. Traditional attribution of authorship assumes that the author has applied their intellect, skill and effort, and appropriately acknowledged and cited the work and ideas of others that have been drawn upon as part of that content. But when generative AI tools are used, it can become difficult to identify what is work genuinely authored by that researcher or research team, or where authors have drawn upon the work of others, without acknowledgment.

In the context of the ARC's grants programs, the ARC's *Policy on the Use of generative AI tools in the ARC's programs* advises applicants to use caution in relation to the use of generative AI tools in developing their grant applications. The ARC recognises that the use of generative AI tools in grant writing presents an opportunity to assist researchers in the crafting of grants proposals, but researchers need to be aware that by using these tools, they may ignite issues around authorship and intellectual property including copyright.

Content produced by generative AI may be based on the intellectual property of others. It may also be factually incorrect or generate inappropriate or what has been termed 'hallucinated' content.

In the ARC's programs, the Deputy Vice Chancellor Research (or their equivalent) at an Administering Organisation is required to certify applications on submission to the ARC. This includes certification that all participants are fully responsible for the authorship and intellectual content of the application, providing assurance that any ensuing grants will be awarded to researchers or research teams that have the knowledge and capabilities to undertake the project.

Administering Organisations, as the applicant, are responsible for ensuring that: applications submitted to the ARC are complete and all details in the application are accurate and current at the time of submission; and that applications do not contain false or misleading information, or otherwise breach the [Australian Code for the Responsible Conduct of Research, 2018](#) (the Code).

Issue 2: Confidentiality and privacy of information, and integrity in the peer review process

Peer reviewers assessing ARC grant applications are asked to provide detailed high quality, constructive assessments that assist the Selection Advisory Committees to assess the merits of an application. These should draw on the assessor's own expertise and analysis. The use of generative AI may compromise the quality and integrity of the ARC's peer review process by diminishing these contributions and, potentially, producing text that contains inappropriate content or commentary that is generic and lacking in rigour.

Another risk in the use of generative AI tools, including but not only within the peer review process, is the loss of protection of confidential information. When information is entered into most commercial generative AI tools (such as ChatGPT), there is an unacceptable risk that it will enter the public domain and be accessed by other users or third parties.

The [ARC Conflict of Interest and Confidentiality Policy \(2020\)](#) requires that all officials and individuals carrying out ARC business, including assessors and peer reviewers, are required to preserve the principles of confidentiality outlined in the policy.

The ARC's policy on the use of generative AI in the ARC's grants programs sets out that release of material into generative AI tools constitutes a breach of confidentiality and peer reviewers, including all Detailed and General Assessors, must not use generative AI as part of their assessment activities.

If there are concerns with how confidentiality and integrity have been managed during a review, the ARC has robust processes to manage these concerns. These are set out in the [ARC's Research Integrity Policy](#). The Research Integrity Policy also allows for the ARC to take precautionary actions to protect the assessment process. Specifically, in cases where the use of generative AI by assessors is suspected, the ARC will remove that assessment from its assessment process.

If, following an investigation, an assessor is found to have breached the *Australian Code for the Responsible Conduct of Research (2018)* (the Code) during ARC assessment, the ARC may impose consequential actions in addition to any imposed by the employing institution.

### Issue 3 – use of generative AI in the conduct of research; Australia's research integrity framework

The Australian community expects research to be conducted responsibly, ethically and with integrity, and the ARC plays a vital leadership role in maintaining and promoting the responsible conduct of research.

The ARC and the NHMRC are jointly responsible for the development and maintenance of Australia's research integrity framework. The ARC and NHMRC provide advice on implementation of the *Australian Code for the Responsible Conduct of Research, 2018* (the Code), and supporting codes, including the *Guide to managing and investigating potential breaches of the Australian Code for the Responsible Conduct of Research, 2018*. The Code is co-authored by the ARC, NHMRC and Universities Australia.

The principles contained within the Code include: honesty, rigour, transparency, fairness, respect, recognition, accountability and promotion. These principles apply to the conduct of research generally, and so would cover use of generative AI in all elements of research and the use of AI should be managed by institutions and researchers according to these principles.

The Code sets out principles and responsibilities that both researchers and institutions are expected to follow when conducting research and adherence to the Code is a prerequisite for the receipt of ARC and NHMRC funding. Through the Code, the primary responsibility for ensuring the integrity of research lies with individual researchers and institutions.

In some elements of the research endeavour, including in the undertaking of peer review, the use of generative AI tools may constitute a breach of the Code. Deviations from the principles outlined in the Code, or breaches, have the potential to seriously damage credibility and trust in the research endeavour, both at an individual, institutional and sector level.

### ARC support for AI research

The development of AI has been supported by ARC grants for over 20 years.

Research projects supported by the ARC have aimed at advancing AI technologies, exploring their potential applications, and promoting their widespread adoption. Additionally, an increasingly significant focus of funded research is around understanding the broader implications and impact of AI on society, culture, and the economy.

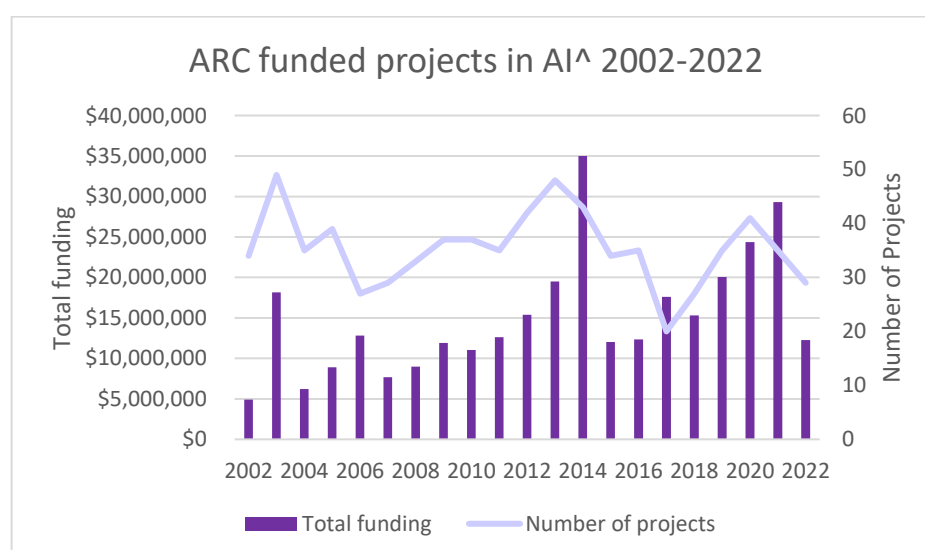
In many research fields, AI tools are being used as a research capability, offering researchers the potential benefits of efficient data analysis, pattern recognition, and predictive modelling, among other advantages.

ARC funding for projects focused on AI research amounts to at least \$323 million across 752 projects since 2002, as categorised by the primary Field of Research (FOR); data is shown in the tables and chart below.

**Table 1: ARC funded projects in AI^ from 2002-2022 by scheme**

Scheme Name	Number of Projects	Total Funding
ARC Centres of Excellence	3	\$29,833,460
ARC Future Fellowships	30	\$24,252,353
Australian Laureate Fellowships	8	\$25,126,475
Discovery Early Career Researcher Award	64	\$23,705,031
Discovery Projects	431	\$139,374,260
Industrial Transformation Research Hubs	3	\$15,000,000
Industrial Transformation Training Centres	1	\$4,133,659
Linkage Infrastructure, Equipment and Facilities	9	\$3,640,603
Linkage Projects	181	\$49,931,552
Other schemes*	22	\$7,983,013
<b>GRAND TOTAL</b>	<b>752</b>	<b>\$322,980,406</b>

**Figure 1: ARC funded projects in AI^ 2002-2022**



**Table 2: ARC funded projects in AI<sup>^</sup> from 2002-2022 by number of projects and funding year**

Year	Number of projects	Funding announced
2002	34	\$4,926,683
2003**	49	\$18,168,899
2004	35	\$6,230,498
2005	39	\$8,922,830
2006	27	\$12,816,174
2007	29	\$7,694,560
2008	33	\$8,980,298
2009	37	\$11,918,030
2010	37	\$11,044,810
2011	35	\$12,628,769
2012	42	\$15,404,553
2013	48	\$19,505,788
2014**	43	\$34,987,291
2015	34	\$12,026,403
2016	35	\$12,341,647
2017	20	\$17,595,343
2018	27	\$15,317,815
2019	35	\$20,041,068
2020	41	\$24,364,546
2021	35	\$29,298,683
2022	29	\$12,280,630
2023 <sup>†</sup>	8	\$6,485,088
<b>Grand Total</b>	<b>752</b>	<b>\$322,980,406</b>

<sup>^</sup> Based on funding awarded, where the primary Field of Research was selected as Artificial Intelligence (FOR 0801 Artificial intelligence and image processing, and 4602 Artificial intelligence)

\* Other Schemes include: Linkage-International; Special Research Initiatives; Super Science Fellowships; Thinking Systems.

\*\*Increased funding in 2003 and 2014 reflects the award of Centres of Excellence with primary FORs in Artificial Intelligence in those years.

\*Based on primary Field of Research (FOR 0801 Artificial intelligence and image processing, and 4602 Artificial intelligence)

<sup>†</sup> 2023 data is incomplete as some funding rounds are not yet announced

Table 1 shows that funding has been awarded across the portfolio of ARC schemes, including Discovery, Linkage and Fellowship schemes. Important groundbreaking work on AI has also been undertaken at ARC Centres of Excellence. Some are captured in the data above, while other Centres have had a broader focus and so are not reflected in this data. Examples of ARC supported research centres which have made significant contributions to Australia's research effort in AI include:

- 2003-2015 National ICT Australia (now Data61, CSIRO)
- 2003-2009 ARC Centre for Complex Systems
- 2003-2007 ARC Centre for Perceptive & Intelligent Machines in Complex Environments
- 2003-2010 Centre for Autonomous Systems
- 2014-2021 ARC Centre for Excellence for Robotic Vision
- 2020-2027 ARC Centre for Excellence for Automated Decision-making and Society.

There have also been a number of ARC supported Australian Laureates working in the field of AI, and looking at the consequences for society. Some recent Laureate Fellowships awarded in this space include:

- Professor Andrew White: Energy-efficient artificial intelligence using quantum technologies (2021)
- Professor Svetha Venkatesh: Pattern analysis for accelerating scientific innovation (2017)
- Professor Toby Walsh: Trustworthy Artificial Intelligence (2020)
- Professor Jie Lu: Autonomous learning for decision making in complex situations (2019).