With Superpowers Comes Great Responsibility
Ethical Use of AI in Research

Images: https://unsplash.com/photos/ZPOoDQc8yMw
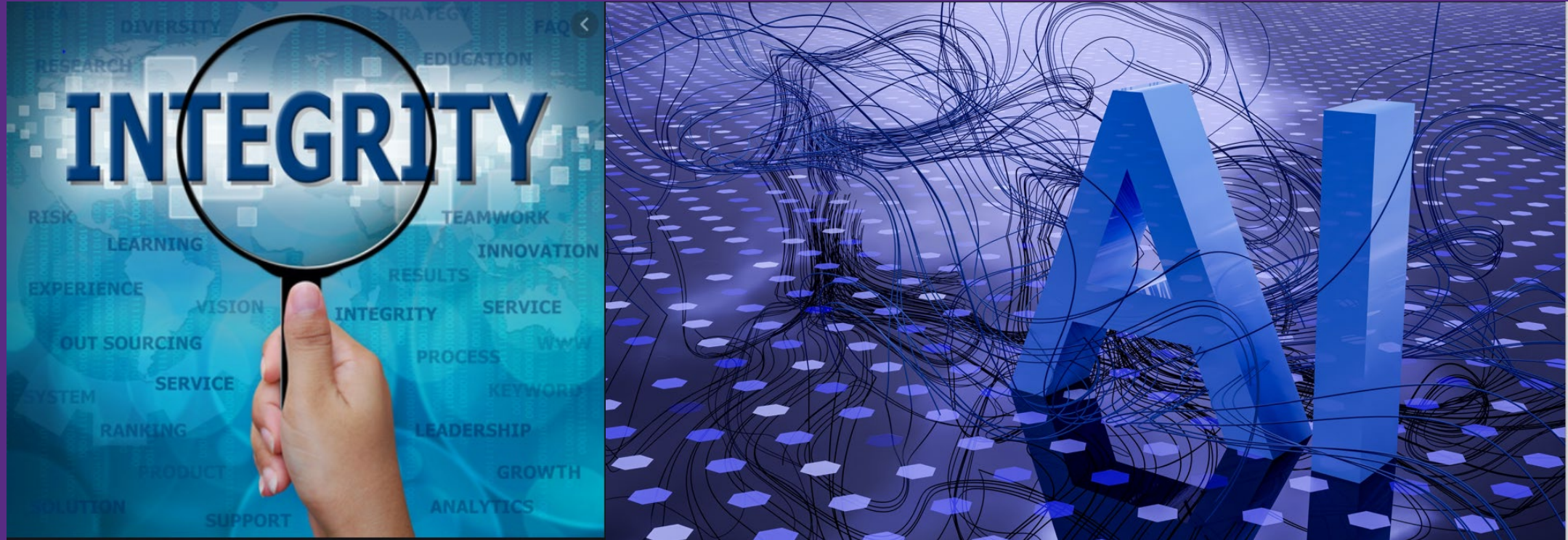
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Generative AI
GAI alone is only as good as the data it's trained on

AI: Development of computer systems which can perform tasks that would typically require natural intelligence, such as learning, problem solving, perception, reasoning and decision-making (Mirjalili S, 2023).

GAI: Subfield of machine learning - <u>deals with generation of new data.</u>

- Traditional AI performs specific tasks based on predefined rules and patterns

- Generative AI creates entirely new data that resembles human-created content

- GAI algorithms are used to create new data: images, text, sounds, videos[1].

Commonly used GAI Tools in Academia:

ChatGPT ; Elicit; Explainpaper; Genei; Galactica; Consensus etc

Future of AI: Continued advances; integration with other emerging technologies; new opportunities for businesses to improve efficiency, productivity & decision-making

Critical to address ethical and societal challenges: Poses risks – research integrity, privacy (disclosure of sensitive information), bias or discrimination, data breaches, data validity, plagiarism, consequences to patients in health care research

1. https://sunverasoftware.com/10-use-cases-for-generative-ai/

Uses of AI in Research[1]

- Literature Review

- Data analysis

- Grant proposal evaluation

- Project management

- Collaboration

- IP Management

- Research Impact Assessment

- Resource allocation

- Science communication

Code (P2): Rigour in the development, undertaking and reporting of research. Underpin research by attention to detail and robust methodology, avoiding or acknowledging biases.
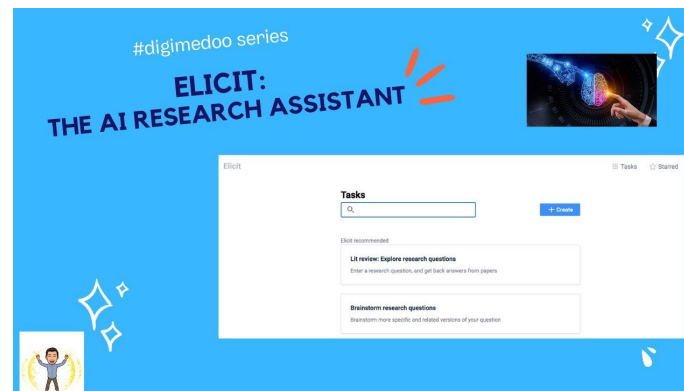**Other Principles:** Honesty; Transparency; Accountability.

WESTERN SYDNEY UNIVERSITY

It is not easy to find a good RA

So I am thinking of using ChatGPT or Elicit (the AI Research Assistant), to do a comprehensive literature review for one of my projects. You know it is so much quicker than hiring an RA and I don't have to worry about the costs (Jane)

#digimedoo series

ELICIT: THE AI RESEARCH ASSISTANT

Elicit

Tasks

+ Create

Elicit recommended

Lit review: Explore research questions
Enter a research question, and get back answers from papers

Brainstorm research questions
Brainstorm more specific and related versions of your question

Response to Scenario 1

Some Considerations	Recommendations
Reliability of a literature review undertaken using the GAI tool: it can suggest plausible sounding but incorrect or nonsensical responses	• Don't rely fully on GAI to do your literature review • Break down your search criteria into smaller chunks • Use it to find structure and help guide your search – may give a framework • Acknowledge use (how much and which sections) of GAI in your literature review • Take responsibility for the content and cross check references
Information source: pre-2021 and often unclear. References can be inaccurate/non-existent. It's formulaic in structure, style, and content.	
AI detection tools	
Tip: Master ChatGPT Prompts with the 'Mother Prompt: https://www.moonshot.partners/blog/master-chatgpt-prompts-with-the-socratic-mother-prompt	

Code (P2): Rigour in the development, undertaking and reporting of research.

Writing Grant Applications

NHMRC/ARC Policy on use of GAI in grant applications and peer review

- Applicants:
  - are to exercise caution when using GAI tools in the preparation of grant applications
  - are accountable for any misinformation and factual errors more broadly, including those resulting from the use of GAI in their applications.
  - and their administering institutions must certify that all information provided in their applications is accurate

- *ChatGPT can be an unreliable assistant, with errors liable to be hidden by a "veneer of perfect English* (Mifsud 2023). Users should cross-check any material they generate with trusted sources. ChatGPT known for inventing spurious "facts" in its answers

- AI is imperfect but could be used to just "guide your grant writing process"

Code (P3): Transparency in declaring interests & reporting research methodology, data & findings.
- Share and communicate research methodology, data and findings openly, responsibly and accurately.

Preparing Ethics Applications

- Ensure that you do not use GAI to write the ethics applications in full: okay to use for a first draft or for editing of the application (can be mainly used for editing/proofreading) – cross check information created by GAI for accuracy, and acknowledge use

- GAI cannot assess risks to research participants or researchers: it is the responsibility of researchers to identify risks and ensure their and their participants' safety

- GAI cannot articulate processes used to obtain consent from participants in real world situations

Code (R17): Comply with the relevant laws, regulations, disciplinary standards, ethics guidelines and institutional policies related to responsible research conduct. Ensure that appropriate approvals are obtained prior to the commencement of research, and that conditions of any approvals are adhered to, during the course of research.

Data Collection and Analysis: Scenario 2

People have no idea what a time –consuming process, data collection is

Honestly, I don't have any time for field data collection for my recently funded research.

So…, I plan to use GAI to collect field data (Jenny)

Response to Scenario 2

Some Considerations	Recommendations
• Is your research ethical? You think you are engaging with a human, when you are actually not	*Few of us like the idea that our creativity and analytical power can be matched by a piece of software – or that we can be duped into thinking we are engaging with a human when we are not*
• Data generated from GAI is fake, misleading	
• Difficult or impossible to really understand why the machine is making the choices that it makes	**So, please collect real world data.**
• Algorithmic bias: Is a major concern with AI	
• Moral de-skilling by using AI which will replace humans	

Data Collection and Analysis

- "GAI alone is only as good as the data it's trained on" – if the data is not diverse or representative, it can lead to skewed results
- Concerns with privacy breaches if original information is not adequately protected
- Data quality: AI driven data collection – may yield lower data
- Over time data collection models can become less effective due to data drift or change in distribution
- Data ownership and control: Data collected by AI systems can lead to disputes and ethical dilemmas over ownership
- AI systems can inadvertently collect and process sensitive or personally identifiable information
- Ethical dilemmas – particularly when it involves sensitive topics or populations
- Reproducibility issues: Challenges with AI driven analysis if model details and/or coding are not well documented/available
- Overfitting: Analytical models perform well on training data but poorly on new, unseen data.

I am under a lot of pressure from my supervisor to publish a journal article (in a high-impact journal)

But, I am so….. busy with my research, teaching, student supervision, administrative work and what not.

So…, I plan to use ChatGPT for my scholarly publishing (Jennifer)

The *Art of* Getting Published

Response to Scenario 3

Some Considerations	Recommendations
• Ambiguities over authorship and copyright of AI generated content.	• Take **responsibility** for the finished product, fact-checking, and for the verification of citations.
• COPE recently issued a position statement - use of AI as author: tools like ChatGPT **-don't meet criteria for authorship**	• **Declare** use of AI: The key factor is accountability responsibility and transparency • **Comply** with AI attribution policies of publishers
• OpenAI accepts no responsibility for any text produced using their product: So, authors are fully responsible for any inaccuracies.	• Remember: The use of AI tools is not inherently unethical - may be useful for authors from NESB, who have learning disabilities or other difficulties with writing (ALA declared). • Need for detection - where their use is not declared.
• Is it ethical for GAI to create art or other creative content that is closely similar to others artwork?	**Code** (R17): Comply with the relevant laws, regulations, disciplinary standards, ethics guidelines and institutional policies related to responsible research conduct. Ensure that <u>appropriate approvals are obtained prior to the commencement of research</u>, and that conditions of any approvals are adhered to, during the course of research.

Thesis Writing

- A Doctorate is awarded in recognition of original, independent and successful research of international standard in the relevant discipline. **A Doctoral candidate should make a substantial original contribution to knowledge** in the form of new knowledge or significant and original adaptation, application and interpretation of existing knowledge (Clause 6, WSU Doctorate Policy)

- HDR students responsible for the originality, accuracy and integrity of their work

- Use of GAI to write substantial sections of a theses or a whole thesis - is regarded as **contract cheating**

- Although GAI can be used for creating a preliminary draft, or for editing, its use needs to be approved by the supervisor and acknowledged. Transparency is critical: between students and their supervisors, transparency between students and the audiences of their work - provided with a clear and complete description and citation of any use of generative AI tools in creating the scholarly work.

Code (R15): Provide guidance and mentorship on responsible research conduct to other researchers or research trainees under their supervision and, where appropriate, monitor their conduct.

Peer Review

As the scientific community continues to evolve, it is essential to leverage the latest technologies to improve and streamline the peer-review process. One such technology that shows great promise is artificial intelligence (AI). AI-based peer review has the potential to make the process more efficient, accurate, and impartial, ultimately leading to better quality research.

- NHMRC and ARC policies on use of GAI in grant applications and peer review

- **Do not use GAI to assess applications**

- Use of GAI in peer review:

  - compromises the integrity of the peer review process and

  - is a breach of the Peer Review Principles and the Australian Code for the Responsible Conduct of Research

- Funding bodies and peer reviewers - bound by the provisions of the Privacy Act 1988 in its collection and use of personal information; and by the commercial confidentiality requirements under section 80 of the NHMRC Act 1992.

Code (R28): Participate in peer review in a way that is fair, rigorous and timely, and maintains the confidentiality of the content.

Upholding Principles of Responsible Research Conduct

Code (P1): **Honesty** in the development, undertaking and reporting of research.

Code (P2): **Rigour** in the development, undertaking and reporting of research.

Code (P3): **Transparency** in declaring interests and reporting research methodology, data and findings

Code (P3): **Accountability** for the development, undertaking and reporting of research

Code (R15): Provide guidance and mentorship on responsible research conduct to other researchers or research trainees under their supervision and, where appropriate, monitor their conduct.

Code (R17): Comply with the relevant laws, regulations, disciplinary standards, ethics guidelines and institutional policies related to responsible research conduct. Ensure that appropriate approvals are obtained prior to the commencement of research, and that conditions of any approvals are adhered to, during the course of research

GAI cannot replace human creativity

GAI cannot think outside the box

GAI is ARTIFICIAL

GAI is susceptible to manipulation

GAI cannot draw upon subjective experiences and emotions in content creation

GAI lacks common sense

GAI is arrogant and fails to recognise its errors

GAI is based on preloaded data, has no ethics or emotions

GAI cannot recognise that if A=B then B=A

GAI is here to stay, offers huge potential and will evolve continually

Questions Comments Feedback