CMB Policy on use of Artificial Intelligence (AI)

Overview

Recent developments in large-language models (LMM) and generative AI have changed the landscape of scientific research. This "AI revolution" comes with major challenges for academic programs. Most of CMB's required and elective courses will contain a statement on AI use in their syllabus, and students should use those as specific guidance for each course. Beyond formal course work, we hereby provide additional guidelines for responsible AI use in the CMB program, aimed at three program-specific applications:

1. Rotation reports
2. Qualifying exam
3. Research writing – manuscripts, fellowships, progress reports, etc

In general, in many cases, heavy use of AI can:

- Lead to the loss of student learning opportunities (e.g.) or "never-skilling" (e.g.)
- Be construed as plagiarism (see UVM Guidelines and Code of Academic Integrity)
- Can lead to misleading results or increase the risk of data leaks.

Thus, students are encouraged to have a discussion with their faculty mentors and/or the CMB Education Committee prior to engaging in AI use.

General guidelines

Acceptable use:

- Initial literature search to organize the introduction. AI can help locate the appropriate articles to provide the background to a project, along with a digestible summary. However, beyond these initial searches, the students are encouraged to extract the citations and consult the primary literature to verify any claims asserted by AI and make their own interpretations.
- Protocol development. AI can be helpful when developing a new technical protocol or trouble-shooting an existing one. As above, take care to verify sources.
- Bioinformatics and code troubleshooting. AI can quickly identify syntax errors and much more in code. It can also generate code *de novo*. Whether the latter is problematic for the student is context-dependent and should be discussed with the mentors.
- Copy-editing for grammar/spelling or English idioms. Features in Word and Google Docs and Grammarly are helpful ways to improve presentability of your writing in these ways.

Borderline acceptable use:

- Refining a written draft for accuracy and narrative/phrasing. This is a grey area – AI can be quite good at "smoothing" narratives – but it can also mask your own literary voice (or prevent you from developing your own style).

Unacceptable use:

- Synthesizing/generating any section of the report/proposal *de novo*, even when the student paraphrases the content provided by AI.
- Blanket addition of references from unread primary literature. Reviewers of manuscripts and qualifying exam committees will routinely look for quality of scholarship in reference choice and ownership of that knowledge. Furthermore, problems of hallucination typically reveal the authors' overreliance on AI for references..

- Uploading any data to the AI platform to analyze/interpret.

Specific applications

1. Rotation reports

The rotation reports represent an opportunity for the students to practice their scientific writing skills in a low-stakes (ungraded) manner, creating a brief review of the relevant literature and a brief description of their methodology and findings. Outsourcing this process to AI can lead to loss of valuable learning, and in some cases can be construed as plagiarism and lead to an unsatisfactory grade/rotation evaluation.

2. Qualifying exam

The qualifying exam is a major milestone for all PhD students in the program. Since the written (grant) component is a major part of this assignment, the temptation to improve the final product is high. However, just like the rotation reports, this is a valuable learning opportunity from 3-4 highly skilled experts in the field (i.e. your studies committee), who can share invaluable grantsmanship tips and insights. This is also your chance to share your roadmap and your thinking for the next 3-4 years of your dissertation journey, so why outsource it to a robot? Overall, the use of AI for the qualifying exam will likely bypass this process and lead to a loss of learning, and as above, can be construed as plagiarism and academic dishonesty. Furthermore, the oral examination portion of this exam will likely reveal reliance on AI in preparation of the written document.

3. Research writing

As students progress to preparation of fellowships and manuscripts, they are strongly encouraged to discuss responsible use of AI with their mentors. As with the two formal assignments above, this process represents, first and foremost, an invaluable learning opportunity for the student, and thus should not be outsourced. Importantly, **unpublished data** or findings uploaded into many open-source AI platforms **are not secure** and can be transmitted to the source platform and stored, creating significant risks for loss of intellectual property. Lastly, it is the responsibility of the student and their mentor to check the rules on AI usage stated by the funding agency and/or journal for manuscript submission.

Document History

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