Project Title: Generative AI use in Statistical Methodology Literature Review and Code Generation

Supervisor: Michael Wallace (Statistics and Actuarial Science)

Student Support: $12,000

Term: Fall 2025

Project Overview

This project will explore the use of generative AI (such as ChatGPT) in conducting literature reviews and coding tasks within statistical science. The following summary is deliberately vague about the specific methods under study, but note that they will be within the biostatistical sciences.

The first objective of the project will be to assess the use of AI in emulating a literature review that has already been conducted by a postdoctoral scholar. This review aims to identify and summarize the extensions to an existing statistical method. You will use generative AI to attempt to emulate this review, noting any strengths and/or limitations of the approach. The postdoctoral scholar will be available to review your work and provide input and feedback.

The second objective of the project will be to use generative AI to assist in extending an existing R package that implements the methods identified in the literature review conducted under objective 1.

The project will conclude with a written report summarizing the findings of both objectives. In particular, the report will discuss the suitability (or otherwise) of generative AI for such tasks, as well as any recommendations for future researchers interested in employing generative AI in such contexts.

Skills and Experience

The ideal candidate will have the following:

- Strong mathematical (especially statistical) skills.
- Strong programming skills, especially in R (but if you have strength in other languages you believe would allow you to pick up R quickly, then that is also fine).
- Strong communication skills, especially written communication skills.
- Familiarity with generative AI/LLMs (an understanding of the underlying theory is a plus).
- Excellent time management and organizational skills.
- Self-motivated (this is a role where you will be expected to conduct a lot of work independently, although regular meetings will be scheduled for updates).

For more information or if you are interested in applying, please contact Professor Wallace at `michael.wallace@uwaterloo.ca` with your CV and transcript.