AI Use Disclosure

MCM 2026 Problem C — Team 2600001

Declaration

This paper utilized Large Language Models (LLMs) for assistance during the research and writing process. We disclose the following uses in compliance with MCM/ICM requirements.

Specific Uses of AI Tools

1. Ideation and Framework Design

- **Tool Used:** Claude (Anthropic)

- **Purpose:** Brainstorming the Pareto optimization framework for balancing fairness and engagement objectives

- **Outcome:** AI suggested the dual-objective formulation; team refined metrics (JFI, FFI) based on domain knowledge

2. Coding Support

- **Tool Used:** GitHub Copilot / Claude

- **Purpose:**

  - Generating Python code snippets for MCMC sampling (Metropolis-Hastings algorithm)
  - Monte Carlo simulation for parallel universe analysis
  - Data preprocessing pipelines (age splines, one-hot encoding)

- **Outcome:** AI-generated code was reviewed, tested, and debugged by team members; all final implementations verified against expected outputs

3. Writing and Refinement

- **Tool Used:** Claude

- **Purpose:**

  - Checking for logical gaps in the methodology (e.g., adding Coefficient of Variation and Posterior Consistency metrics)
  - LaTeX formatting assistance

    – Grammar and clarity improvements

- **Outcome:** All substantive content decisions made by human team members

4. Literature and Concept Clarification

- **Tool Used:** ChatGPT

- **Purpose:** Explaining Bayesian inference concepts and Kendall's tau interpretation

- **Outcome:** Used for learning; all citations verified through original sources

Human Verification and Responsibility

We confirm that:

1. **All mathematical derivations** were verified by hand or through independent computation

2. **All code execution** was performed on our own machines with results manually inspected

3. **All statistical results** (accuracy rates, correlation coefficients, etc.) were computed from actual data, not AI-generated

4. **All final conclusions and recommendations** represent the judgment of human team members

5. **No AI-generated text** was used verbatim without review and modification

Tools and Versions

- Claude (Anthropic, January 2026)

- ChatGPT (OpenAI GPT-4, January 2026)

- GitHub Copilot (VS Code extension)

- Python 3.11 with NumPy, Pandas, SciPy, Matplotlib

This disclosure is submitted in accordance with MCM/ICM 2026 guidelines on AI tool usage.