AN6819 - BEYOND ALGORITHMS: THE FUTURE OF AI AND GENAI INNOVATIONS
2024/2025 Trimester 3

Your Mission: This capstone project challenges you to critically explore and analyze key aspects of Generative AI from a theoretical, ethical, or strategic perspective. You will conduct in-depth research to develop a significant analytical contribution, demonstrating your understanding of the field, its potential, and its implications without hands-on model building.

Project Journey (Key Milestones):

1. **Define Your Inquiry**

    ○ **Focus:** Pinpoint a critical question, emerging trend, ethical challenge, strategic application, or theoretical comparison within Generative AI that you wish to investigate deeply.
    ○ **Scope Your Research:**
        ■ Identify specific GenAI models/technologies (e.g., GANs, VAEs, Transformers, Diffusion Models) as the subject of your analysis.
        ■ Define the application areas or societal contexts you will examine.
    ○ **Outline Your Approach:** Describe your research methodology (e.g., extensive literature review, comparative analysis of published works, case study deconstruction from public information, ethical framework development) and the main arguments or analyses you anticipate presenting.

2. **Conduct In-Depth Research & Synthesis**

    ○ **Investigate:** Dive deep into academic papers, peer-reviewed journals, technical reports from leading AI labs, industry analyses, ethical guidelines, and policy documents.
    ○ **Analyze Critically:** Go beyond summarizing. Evaluate the strengths and weaknesses of arguments, synthesize diverse information and perspectives, identify key insights, current challenges, or unexplored gaps in understanding.

3. **Formulate Your Contribution & Develop Your Thesis**

    ○ **Develop:** Based on your research, construct your core thesis, in-depth comparative analysis, strategic application proposal (purely conceptual), ethical impact assessment, or theoretical framework.
    ○ **Articulate Clearly:** Structure your arguments logically and support them comprehensively with evidence and citations from your research.

4. **Present Findings, Implications & Recommendations**

- ○ **Discuss:** The broader societal, ethical, technical, or future research implications stemming from your analysis.
- ○ **Recommend (if applicable):** Potential best practices, policy considerations, avenues for future theoretical exploration, or strategic considerations based on your findings.

Possible Areas of Investigation (Choose one, adapt, or propose your own with approval):

- ● **In-Depth Ethical Impact Analysis:** (e.g., a deep dive into the ethics of deepfakes in media, AI-generated art and copyright, or bias amplification in LLMs, based on existing literature and case studies).
- ● **Comparative Theoretical Analysis of Generative Models:** (e.g., A research paper comparing the theoretical underpinnings, reported capabilities, and limitations of GANs vs. VAEs vs. Diffusion Models for a *specific type* of data generation, based *solely* on published papers and technical documentation).
- ● **Strategic Application Proposal (Conceptual Design & Impact Study):** (e.g., A detailed proposal on how specific GenAI models *could theoretically* be applied to address a major societal challenge – outline potential benefits, risks, *theoretical* data requirements, and necessary ethical safeguards, all based on research).
- ● **State-of-the-Art Survey & Future Outlook:** (e.g., A comprehensive literature review on a cutting-edge GenAI subfield like multimodal generation, controllable AI creativity, or the future of large language models, synthesizing recent research to predict future trends and challenges).
- ● **Developing a Framework for Responsible GenAI Governance or Development:** (e.g., Proposing a novel conceptual framework based on existing research and ethical principles).

Final Deliverables:

1. **Substantial Research Paper or Analytical Report:** (10 pages, thoroughly researched and cited).
2. **(Appendix may include:** Annotated bibliography, detailed analysis of key case studies/papers cited).