

# IE7374 - Generative AI

## Course Project Guidelines

The course project provides students with an opportunity to dive deeper into the field of deep generative modeling, fostering creativity, collaboration, and critical thinking. Projects will be completed in groups of up to three students and should align with at least one of the following categories:

- **Application of Deep Generative Models:** Explore the use of generative models to solve novel tasks or analyze unique datasets. Projects in this category could include developing models for domains like healthcare, finance, or natural language processing with a focus on creating impactful applications.
- **Algorithmic Improvements:** Investigate enhancements in the evaluation, training, or inference methods of generative models. This could involve optimizing existing architectures, reducing computational complexity, or introducing novel training paradigms.
- **Theoretical Analysis:** Conduct rigorous analysis of the mathematical foundations or properties of deep generative models. This might include studying the convergence properties, generalization bounds, or the behavior of specific components like variational approximations or adversarial loss functions.

## Project Proposal

Each group is required to submit a project proposal by the **third week of the semester**. The proposal should include:

1. **Title:** A concise and descriptive title for your project.
2. **Objective:** Clearly define the problem you aim to solve and the relevance of your approach.
3. **Background:** Summarize relevant literature and existing solutions.
4. **Methodology:** Provide a brief outline of the methods and tools you plan to use.
5. **Expected Outcomes:** Describe the anticipated results and their potential impact.
6. **Team Roles:** Specify the responsibilities of each team member.

Proposals will be evaluated based on originality, feasibility, and potential contribution to the field.

## Project Milestones

To ensure steady progress, the project will be divided into the following milestones:

- **Milestone 1 (Week 5):** Initial progress report, including dataset preparation, model selection, and preliminary results.
- **Milestone 2 (Week 8):** Mid-term report detailing significant progress, updated methodology, and refined objectives.
- **Milestone 3 (Week 13):** Final report draft submission for feedback.

### Final Submission and Presentation

The final project deliverables are due in the last week of the semester and include:

1. **Final Report:** A comprehensive document (8-10 pages) structured as follows:
  - Introduction
  - Related Work
  - Methodology
  - Experiments and Results
  - Discussion
  - Conclusion and Future Work
2. **Code and Documentation:** Well-documented codebase, submitted via a GitHub repository.
3. **Presentation:** A 10-15 minute presentation summarizing your project, followed by a Q&A session.

### Evaluation Criteria

Projects will be assessed based on the following criteria:

- **Innovation:** Originality and creativity in tackling the problem.
- **Technical Depth:** Rigor and complexity of the methods used.
- **Implementation:** Quality and completeness of the implementation.
- **Analysis:** Clarity and depth of the experimental analysis.
- **Presentation and Report:** Coherence, professionalism, and clarity of the final deliverables.

### Academic Integrity

Students are expected to adhere to the highest standards of academic integrity. Plagiarism, unauthorized use of external resources, or any form of academic misconduct will not be tolerated.

We encourage students to take advantage of this project to explore their interests, push the boundaries of their knowledge, and contribute meaningfully to the field of deep generative modeling. Let your creativity guide you, and don't hesitate to seek guidance from the course staff as needed.