# Deep Learning Project Guidelines

Instructor: Dr. Shusen Pu

## 1 Overview

This project aims to deepen your understanding of deep learning methodologies, with a focus on applying concepts learned in this class to real-world datasets or research studies. Students will choose a dataset or topic of their interest, or select a peer-reviewed paper (see "2 Project Options" for more information). If opting for an independent topic, you must propose the dataset and obtain instructor approval. All projects require using deep learning techniques discussed in class, ensuring practical application and skill development.

## 2 Project Options

Students may choose one of the following options for their project:

- Select a dataset or topic of personal interest, find the dataset, and submit a proposal for approval.
- Reproduce a paper that has been cited at least 200 times, published within the last three years, and has publicly available code. The chosen paper must be approved by the instructor.

## 3 Objectives

1. Analyze a chosen dataset or replicate a study's findings using deep learning techniques.
2. Explore and extend the results by testing methods on new data or creating modifications.
3. Develop individual Python code segments and understand their role in the overall analysis.
4. Reflect on coding progress based on initial Python proficiency.

## 4 Project Requirements

### 4.1 Proposal Submission

Groups or individuals must submit a short proposal outlining:

- The dataset or topic selected, including its source (for independent projects).
- A brief plan of analysis and the deep learning methods to be used.
- Each group member's initial Python proficiency.

Proposals must be approved before proceeding.

### 4.2 Analysis and Coding

- Utilize deep learning methods from the course to analyze the dataset or replicate results.
- Each student must write a portion of the code independently; fully relying on others' work is not permitted.
- Python coding grades will consider initial proficiency, evaluating progress for beginners and quality for experienced programmers.

### 4.3 Independent Projects

For students choosing their own topic:

- Find and submit a dataset along with your proposal for approval.
- Conduct a unique analysis and provide insights based on the dataset.

### 4.4 Suggested Papers

Students selecting a paper from the provided list should:

- Reproduce key results from the study using publicly available resources (e.g., GitHub, Google).
- Extend the study's methods by applying them to new data or making significant modifications.

### 4.5 Report and Code Submission

Each group must submit:

- A concise written report (minimum 1500 words) explaining the project, analysis, challenges, and outcomes.
- Clear and well-documented Python code demonstrating the analysis.
- Contributions and roles of each group member.

## 5 Grading Rubric

| Criteria | Description | Points |
|---|---|---|
| Understanding and Analysis | Depth of understanding and analysis of the dataset or paper. | 25 |
| Coding | Individual contributions, documentation, and progress or quality based on proficiency. | 25 |
| Extension or Application | New insights or applications based on the original study or dataset. | 20 |
| Report Quality | Clarity, structure, and completeness of the report. | 20 |
| Collaboration | Equal and active contributions from all members (for group projects). | 10 |

## 6 Deadlines

1. **Proposal Submission: Friday, 01/29/2025, 11:59 pm CDT**.
2. **Progress Update: Friday, 02/07/2025, 11:59 pm CDT**.
3. **Final Submission: Friday, 02/14/2025, 11:59 pm CDT**.