Spring 2025
Introduction to Artificial Intelligence

Final Project Specification

Introduction

The final project is designed to give you an opportunity to apply what you've learned throughout the course to a topic of your interest. Through this project, we hope you will deepen your understanding of the subject, gain hands-on experience in problem-solving, and practice communicating your ideas clearly and effectively.

You are expected to submit a **15-minute video-recorded presentation along with your presentation slides.**

Example: Final Project example

Topic Selection:

You are free to choose your own final project topic, and feel free to reach out to the TAs if you'd like to discuss your ideas. We also recommend looking through previous works to get a sense of topics that have been explored.

You can choose a final project topic inspired by previous works that interest you and further **improve or modify them**. In your report, please clearly **highlight how your work differs from the original**.Alternatively, you are free to explore other topics that interest you.

Important: No matter what topic you choose, If your chosen topic is similar to previous works, you must compare it with prior work and clearly state the differences. Otherwise, you may not receive credit for the **Originality** component of the evaluation.

Video Recorded Presentation

Please read the following instructions carefully. The following items are expected to be covered in your presentation. We will grade your score based on these sections. If you have any questions regarding your final project, please post them in the designated forum for discussion on E3 system!

- **Introduction** - Brief overview of your problem. Why is this problem important? Why do we spend time working on this? how does your work differ from the original?
- **Related Work** - Describe papers/works that are relevant to your final project. Please also explain the difference between your work and the existing ones.
- **Dataset/Platform** - Explain the dataset/platform you used for your final project. For instance, the size of the dataset, distribution of classes, or how you implement a platform for Game AI.
- **Baseline** - Explain how you implement baselines. For example, you are working on an object recognition problem. You may choose Convolutional Neural Network (CNN) as your baselines. Your main approach may be a Transformer. Please give a brief description of the baselines in the video.
- **Main Approach** - Please propose a main approach. You should describe the algorithm in detail. Specifically, please discuss how they apply to your problem (what are the inputs/outputs, variables, factors, states, etc.)?
- **Evaluation Metric** - Please include metrics, both qualitative and quantitative, you are using to evaluate the performance of your baselines and proposed method. Note that please explain your metrics in detail.
- **Results & Analysis** - Please present the performance of your baselines as well as the main approach. Additionally, please analyze the results you obtained. For example, you are working on an object recognition problem, and there are 10 different classes. Most of the classes achieve reasonable results using CNN. However, one of the classes performs unsatisfactory compared to others. Why?

Presentation Slide

The slide should include the aforementioned items. Additionally, please have the following items:

- **Github Link** - Please upload your source code to Github. Your github repo should include an overview of the task, prerequisite (your coding environment, packages version (e.g., requirements.txt in Python)), usage, hyperparameters you set, experiment results, and so on.

- **Reference -** Please provide the reference to the original source code, dataset, or the method you use.

- **Contribution of each member** - Please include the contribution of each member with **proportions**. We understand the condition that some members

may fail to contribute to this project; thus, we will adjust your score if the contributions are significantly unequal. Feel free to let us know if you have any concerns about this part.

NG Topics

- Direct application of existing methods to simple problems
    - RL for small games (pacman, mario, …)
    - CNN for xxx classification
- If we find that your work is similar to past projects from the last three years **without any comparison**, your final project score will be low.

Hint

We provide some possible directions for your final project:
- Work on a project that applies learned or new algorithms for interesting/important applications
- Detailed analysis of an existing algorithm

It is important to stress test an algorithm on a new problem/dataset and in the wild. We encourage you to analyze the root cause of failures and to propose an alternative.

Submission

1. **On E3 system :**

   The deadline is 6/3 (Tue) at 17:00. You need to submit the following two files to the E3 system.
   - **Link of your video** (Please attach the video link in the Link.txt file)
   - **Final Presentation Slides** (The filename should be Team{TEAM_ID}_Slides.pdf
       - It's Team ID, not your Group ID!! *ex. Team50_Slides.pdf*
       - You can find your Team ID in the Google sheet

   ```
   ├── 📄 Link.txt
   └── 📄 Team{TEAM_ID}_Slides.pdf
   ```

2. As this is the final project, we **DO NOT** accept any late submissions.
3. **Only one team member needs to submit the recorded presentation and slide.**
4. **In Google sheet: 2025 :**

   Please also fill in the Google sheet: 2025 with the corresponding item before each due date as the following. **Late submissions will not be accepted under any circumstances.**

Group Name (Due: 4/18)		Topic (Due: 4/29)
I am AI		

Initial Proposal (Due : 4/18)	Progress Report Slides (Due: 4/29)	Revision Report Slides (Due: 5/6)
https://drive.google.com/file/d/XXXXX	https://drive.google.com/file/d/XXXXX	https://drive.google.com/file/d/XXXXX

Github Repo (Due: 5/13)	Final Presentation Slides (Due: 6/3)
https://github.com/XXXXXXX	

Peer Review (Due : 5/2 17:00)
Check the checkbox if your group had finished reviewing 3 other groups

5. **Timeline:**

- **4/18 17:00 — Initial Proposal**
  - Propose **at least 3 potential topics and challenges**
    - You can choose from previous works that interest you or explore other topics that interest you.
- **4/29 17:00 — Progress Report Slides**
  - Submit **2–3 slides** to **Google sheet: 2025** including:
    - Topic
    - Progress and goals
    - Comparison with previous work
- **5/2 17:00 — Peer Review Deadline**
  - Further details will be provided in future updates
- **5/06 17:00 — Revision Report Slides**
  - Revise your report **based on peer review feedback**
  - Submit **3-4 slides** to **Google sheet: 2025** including:
    - **Feedback Response Slide (1 page)**
      Respond to **each piece of feedback** and indicate the corresponding revision. If you believe the feedback is not appropriate, provide a clear explanation in response.

    - **Revision Proposal (2-3 pages)**
      Revise your initial proposal

- **5/13 17:00 — GitHub Repository**
  - Create your **GitHub repo** (you can modify it afterward)
- **6/03 17:00 — Final Presentation Slides**
  - Submit your final presentation slides

6. Peer review will take place **from 4/29 to 5/2**. Each team is required to review the work of **three other teams** and provide constructive feedback. To avoid causing inconvenience to other teams, all reviews must be completed within

the specified time frame. Teams that fail to complete the peer review on time will receive a **10-point penalty**. Further details will be announced later.

7. We will select **5 groups** for a live presentation on **6/10 (Tue.) (tentatively)**. We note that those selected groups **should** present your work (not optional this time). Those selected groups will **have additional scores and perhaps some bonus awards** (e.g., best poster, best presentation, and best-voted poster/presentation). Please be well-prepared as you might be one of the outstanding teams.

Scoring Criteria

Revision slide 10%:
Full credit will be given only if all feedback is appropriately addressed and revised. Otherwise, only partial credit will be given.

Final presentation (Slide & Video) 90%:
Hard constraint: NG topics at most 50 points, plagiarize from 2024/2023/2022 will get 0 points.

1. Originality (15 %)

15%	Surprising application or analysis aspect
10%	Utilize different dataset or model/method
0%	Only reproduce reference

2. Difficulty (10%):

10%	Topics from NeurIPS benchmark/dataset or other challenging topics
7%	other cases

0%	CNN classification for xx / RL for small game

3. Clarity & Organization(15%)

   Richness and clarity of expression

   - Introduction

   - related work

   - dataset / baseline

   - proposed method

   - contribution of each member

4. Completeness (50%)

   Including：

   a. Introduction (5)

   b. Related work (2)

   c. Dataset/Platform (5)

   d. Baseline (3)

   e. **Main Approach (15)**

      - Only use pre-built models from packages (scikit-learn, PyTorch …etc)：at most 5 points.

      - No explanation of your approach in detail: minus 5 points

   f. Evaluation metric (5)

   g. **Results & analysis & Others (15)**

      - Type of experiment (5)：If there is only one type,e.g., change the learning rate, then you'll get at most 2 points.

      - Discussion and analysis (5)：Only numerical values without discussion and analysis will receive a maximum of 2 points.

      - Limitation of your work (2)

      - Try to apply the model/method to practical use. (3)

<u>Example</u>

1. Originality (15 %)

15%	
10%	V
0%	

2. Difficulty (10%):

10%	
7%	
0%	V (CNN for xx classification)

3. Clarity & Organization(15%) **base on your video presentation**

   Richness and clarity of expression

   ● Introduction

   ● Related Work

   ● Dataset / Baseline

   ● Proposed Method

4. Completeness (50%)

   Including：

   a. Introduction (5) **5 points**

   b. Related Work (2) **2 points**

   c. Dataset/Platform (5) **5 points**

   d. Baseline (3) **3 points**

   e. **Main Approach (15)** **8 points**

- Only use pre-built models from packages (scikit-learn, PyTorch …etc)：at most 7 points

- Do not explain the detail of your approach: minus 5 points

f. Evaluation Metrics (5) **5 points**

g. **Results & analysis & Others (15)** **12 points**

- Type of experiment (5)：If there is only one type,e.g., change the learning rate, then you'll get at most 2 points. **5 points**

- Discussion and analysis (5)：Only numerical values without discussion and analysis will receive a maximum of 2 points. **5 points**

- Limitation of your work (2) **2 points**

- Try to apply the model/method to practical use. (3) **0 point**

Completed analysis but with an easy task and naive method won't get many points in total.