Department of Computer Science and Software Engineering

COMP433 Introduction to Deep Learning

Course Project Guideline[1]

Evaluation

Deliverable	Submission Date	Weight
Team Formation	September 21st	-
Proposal Submission	October 5th	10%
Progress Reporting	November 2nd	20%
Final Reporting	November 30th	40%
Final Presentation	November 30th	15%
GitHub Submission	November 30th	15%

Main Objective

The project of the course gives you an opportunity to implement what you have learned in the course in a project of interest. There will be two possible tracks for groups that want to submit their own project proposal:

- **Kaggle Challenges.** In Kaggle challenges https://www.kaggle.com/competitions, you are expected to choose an open competition, which requires you to study the problem and propose a solution. Note that you must choose an open competition with image or text or speech data to apply deep learning models there. You should also check the data size because the project should not require a lot of computational power i.e. GPU. Note that in this track, you will be judged on your ability to apply a methodology and a sound solution that works well in a challenging problem.
- **State-of-the-Art (SOTA) Reproduction.** This track focuses on re-implementing a recent model published at top-tier deep learning conferences. You are free to choose your application and the problem. You must choose a published paper at conferences in any of these four conferences within the last three years

[1] Adapted from Fall 2024 guideline by Dr. M. Hosseini

- Computer Vision and Pattern Recognition (CVPR): CVPR2023, CVPR2024, CVPR2025
- Neural Information Processing Systems (NeurIPS): NeurIPS2023, NeurIPS2024
- International Conference on Learning Representations (ICLR): ICLR2023, ICLR2024, ICLR2025
- International Conference on Machine Learning (ICML): ICML2023, ICML2024, ICML2025

Note that here you will be judged on your ability to re-implement a SOTA method and apply it on different datasets or settings.

Team Formation [Deadline: Sunday 11:59PM, September 21st, 2025]

Students are required to form a team of Four (4) members for the course project. Please submit your team's detail by email to the lecturer and the Lead TA following the email inquiries guideline. A Q&A discussion forum will be created for the course on Moodle and you can use the platform to open a discussion on team formation related topic. Students who cannot find a team will be randomly shuffled in incomplete teams. The team, once formed, will stay the same until the end.

Proposal Submission [Deadline: Sunday 11:59PM, October 5th, 2025] (Counts for 10% of the course project grade)

You should write a one-page proposal for the course project to cover the following topics:

- *Problem Statement and Application*: provide a background about the topic to be investigated and specify why the problem is interesting and important? What are the associated challenges of the problem application? What are your expectations/goals throughout developing the application of interest?

- What reading material (e.g. papers, scientific reports, etc) will you examine to provide context and background?

- *Possible Methodology*: highlight the possible method or algorithm you are proposing. Are there any existing implementations to be used and how will you use them? How are you planning to improve or modify such implementations? You may not have the exact answer here but try to give an answer that you will follow as much as possible.

- *Metric Evaluation*. Discuss how you will evaluate your results both in terms of qualitative and quantitative analysis. Qualitatively, what kind of results do you expect (e.g.

plots or figures)? Quantitatively, what kind of analysis will you use to evaluate and/or compare your results with (e.g. what performance metrics or statistical tests)? All these metric evaluations will be used to assess and evaluate the pipeline and your expectations regarding the kind of results/performance to be achieved.

- *Gantt Chart*: use an additional page (supplemental material) to illustrate a Gantt chart of the project development to list (a) schedules and (b) items of milestones and deliverables. Note that you cannot use this page to extend your proposal description.

- *Bibliography*: use an additional page to extend your reference list cited in your proposal. The citations may include, but not limited to, published papers and domain links. (include a link to your dataset). Please note that failure to properly cite your references constitutes to a plagiarism.

You will be given the opportunity to submit your proposal for revision by the professor/Lead-TA, before the final graded submission. Only the admin (one person) of your team needs to upload the proposal in PDF file in Moodle.

For the report format, please consult "Reports Formatting" Section in this guideline. Our team (TAs and lecturer) will review your proposal and, if it is acceptable, you may proceed with developing the next phase of your project. Otherwise, we will instruct you to either revise or re-write the proposal according to the guidelines of the course project. All teams are highly encouraged to put great effort on preparing the first proposal draft to avoid further delays in project developments.

Progress Reporting [Deadline: Sunday 11:59PM, November 2nd, 2025] (Counts for 20% of the course project grade)

Each team is required to submit a three(3)-page progress report highlighting the main steps taken after the proposal, and any initial results (if available). The progress report should contain the following sections:

1) *Introduction*: In addition to defining the problem and its applications, discuss the general strategy followed by existing methods for tackling the issue at hand. Discuss the challenges faced in solving this problem and your proposed solutions to address them. Discuss what results you expect and how you want to acquire/evaluate them.

2) *Method*: Give updates regarding the methods used/to be used. Discuss the application, dataset(s), deep learning model(s) in more detail.

3) *Attempts at solving the problem*: elaborate on failed or successful attempts at tackling the problem. Furthermore, discuss any possible/preliminary results.

4) *Future Steps*: Discuss the plan for the next period and the remaining steps to be executed.

5) *References*: add an additional page to extend your reference list cited in your progress report. The citations may include, but not limited to, published papers and domain links (include a link to your dataset).

6) *Supplementary Material* [this section is appended to the main report draft]: you are encouraged to include appendices to your report to support different sections of the main draft in more detailed analysis. **Note: this section will not be considered for marking.

The progress report should be in PDF format and uploaded in Moodle. For the report format, please consult "Reports Formatting" Section in the third page. Please note only the admin (one person) of your team needs to upload the progress report in PDF file in Moodle.

Final Reporting [Deadline: Sunday 11:59PM, November 30th, 2025] (Counts for 40% of the course project grade)

The final report should articulate the following sections:

1) *Abstract*. Articulate on the abstract presentation of the project and what to expect by reading your report in full detail. Briefly discuss the problem, proposed methods and used data, and the achieved results. [maximum of 150 words].

2) *Introduction* [the abstract & introduction should be around 2 pages]:

a) Write a section to cover the problem statement and its importance to the application field. What are the associated challenges with respect to the problem? How is this report trying to solve the problem and a challenge in mind? Elaborate on the high-level abstract explanation of your methodology and what kind of implementations you have done. What kind of results you are obtaining?

b) Related works. Write a subsection to cover literature review and related work descriptions.

3) *Methodology* [this section should be around 3 pages].

The methodology section should cover the proposed idea to solve the problem stated in your introduction. You can use figures/diagrams to better explain your methodology. If applicable, emphasize on the improvement/new approach you have taken to solve the problem.

4) *Results* [this section should be around 3 pages].

This section describes and analyzes the experimental design and obtained results in detail. More specifically

- Experiment Setup. you need to describe how you setup your experiments, optimized and validated your deep learning models, the performance analysis using appropriate metrics (precision, recall, F1-measure, ...). Explain the ranges of hyper-parameters and rational behind selecting as such in relation to your data and models.

- Main Results. Demonstrate the main results in figure/table formatting and analyze the performance of your implemented results. Discuss the results and use any means of visualization/table formatting/figure demonstration to better explain the obtained performances.

- *References* [this section lists all references beyond the eight page of your report]:

Cite any references you used in the projects, including any source code and dataset you have used in the project. Please note that failure to properly cite your references constitutes to a plagiarism and will be deemed for reporting.

6) *Supplementary Material* [this section is appended to the main report draft]:

You are highly encouraged to include appendices to your final report to support different sections of the main draft. **Note: this section will not be considered for marking.

Reports Formatting

The proposal (1 page + 1 page Gantt Chart supplement + 1 page bibliography), the progress report (3 pages + 1 page bibliography), as well as the final report (8 pages + bibliography page(s) + possible appendices) should all be written in **CVPR LaTeX template** for your final PDF submission. ***Note: other formats will **NOT** be accepted. Note to use the **REVIEW** style for LaTeX compilation.

Final Presentation [Deadline: Sunday 11:59PM, November 30th, 2025] (Counts for 15% of the course project grade)

Each team should prepare an eight(8) minute recorded video from a slide presentation and submit the following

- A 10-Page deck of slides prepared in PDF format (you can use either PowerPoint or LaTeX beamer for your slide preparation). Slides should contain a high-level overview of the problem and goals, the type of data you were dealing with, your methodology, the obtained results, and the references used.
- An eight(8)-minute recorded video from the team, each member taking a round of 2 minutes in a row to complete the record.

GitHub Submission [Deadline: Sunday 11:59PM, November 30th, 2025] (Counts for 15% of the course project grade)

Whether you use Git to organize your coding throughout the project or not, each team should create a new GitHub page for the project from the beginning. The GitHub page should be created in "**private**" mode and each member should be given access to commit their updates on a regularly basis during the course of the project. Furthermore, the lead TA for the project team as well as the lecturer should be given access to the GitHub page for monitoring the progress of the team. Note that commits from each team member will be monitored for the engagement of individuals and considered as one of the means of marking to contribute to their final project. The final GitHub page should contain the following

- High level description/presentation of the project
- Requirements to run your Python code (libraries, etc)
- Instruction on how to train/validate your model
- Instructions on how to run the pre-trained model on the provided sample test dataset
- Your source code package in PyTorch
- Description on how to obtain the Dataset from an available download link

Please note that if the instructions to run your code are incomplete or not explicit enough, you might lose marks for that part of the project. You should add the professor and the Lead-TA as contributors to your project. The GitHub IDs will be shared via Moodle.

How to Submit Your Project Materials? [Deadline: Sunday 11:59PM, November 30th, 2025]

Submit all the files in one zip file including

- PDF file of the final report

- Deck of 10-Slide page presentation in PDF format
- README.txt containing the following two links:
- A link to your GitHub page.
- A download link to your video presentation
- A sample test dataset (100 images or text, etc)
- One page that includes a table listing the contribution of each team member to the project. The table format should be in four(4) columns pertinent to individual members of the team. The pertinent information will be considered to grade individual contribution to the project.

The zip file should be uploaded by the admin of the team in Moodle by the final submission deadline.

Late Submissions Policy

If you submit any part of the project later than the specified deadline on Moodle, your submission will be accepted until the cut-off date. However, you will lose 20% of the mark for each day you submit late. The cut-off date is maxed up to two (2) days and submission after the cut-off date will not be accepted. Further, please note that resubmitting your files will result in erasing all the previously submitted versions and their respective dates. The date of the last attempt at submission will be counted as the final submission date.

Peer Evaluation

Towards the end of the project, each group member will submit a peer evaluation form evaluating the other team members. The individual project grade obtained by a member will be influenced by the overall evaluation from other team members.

Potential Paper Publication (Optional Track)

While this track is completely optional, interested project group can consult with the lecture team (i.e. professor and lead TA) on the possibility of submitting their work to main/workshop venues of ML conferences. This will be decided after submission of your final project material.

Email Inquiries

For all inquiries about the course project, the subject line must follow a prefix topic [COMP433 Project: *{your subject}*].