SEP769 CYBER PHYSICAL SYSTEMS DEEP LEARNING PROJECTS

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Contents

Introduction

For the second part of the SEP 769 course, students need to complete one hands-on project in a group of 2-5 students. All projects are implementation based. Each deep learning project is adapted from a Kaggle competition or other well-known dataset, where a challenge (from a specific industry) for an open-source dataset is stated.

Each group can pick their project from the project lists (list from previous years (2023, 2024), or current year project list) uploaded on Avenue along with this document. Also a list of websites with freely available datasets used in these projects is uploaded on Avenue. Some more project options are given in "Picking your project" section below.

The teams will report in detail the results of their findings and comment upon the understanding that they have developed about the problem domain

Students should continue working in the same groups that they were working while during the first part of this course. If any student has reservations, he/she can contact me and discuss.

Picking your project

Each group should send me an email at [mirzaa24@mcmaster.ca] (subject line starting with "SEP769 DL Project") and rank the projects in the order you would like to work on them (e.g., a project at rank #1 is the project you would like to work on the most and the project in rank #5 means you are least interested in). Then, based on your preference and popularity distribution of projects, a project will be assigned to your group.

Note:

1. You may decide to work on a project of your own liking. In that case, you need to submit the details of you project in the project proposal and get instructors approval/comments before proceeding further.

Deliverables and Deadlines

1. Project Option Submission and Team Members – Sunday, July 6th, 2025

Students need to form a group (2-5 students) and submit your project options along with the names and student IDs of group members, by 6th July 2025 (Sunday mid-night) in the following format:

Group [# here]/ Team Members

No.	Student ID	Student name
1		
2		
3		
4		
5		

Project Options

Rank	Project Title
#1	
#2	
#3	
#4	
#5	

Assignment of Projects to Groups – July 7th, 2025

Projects will be assigned to the groups by Monday, July 7th, 2025 (mid-night) by the instructor. Groups can send their concerns to resolve any issues as soon as possible.

2. Final Project and Its Submission – Sunday, August 3rd, 2025

The deliverables for the final projects are:

1. **Final Report** –This should give all the details of your project in the form of Word/LaTeX report style document. The report should include sections on (1) Introduction, (2) Problem Statement / Review / Background, (3) Theory and Datasets, (4) Implementation Details, (5) Explanation of the Source code, (6) Results and Discussion, and (7) Recommendations for Future work.

2. **Recorded Video Presentation** – Each project group is required to prepare a short video presentation of their project and submit it along with their final report. The video should be between 15 - 25 minutes duration. This is usually the time allocated for a conference presentation.
3. **Project Code** – Each group will submit a link to a Github repository or zip file with the code of your final project. The root directory of the code should have a README.txt file giving details about how to download the dataset required and to run the code in the repo/zip file to replicate the results given in the final report.
   o Codes must be clean, commented, easy-to-read, and executable (fully functional without errors).
   o If not submitting the code in zipped file, you are recommended to create a GitHub repo and commit your codes there (share the link to the repo in report)
   o Codes will be reviewed using an AI-powered tool, so be careful. There is zero-tolerance policy for plagiarism.

Further breakdown of the 85% marks for the final project will not be given and depends on the evaluation metric used by the instructor for that project (will mainly depend upon the submitted report, video presentation and the code). Some of the following factors will be considered while evaluating the projects:

1. **Technical quality** of the project.
2. **Significance** – did the group work on a real-world problem or only a toy-problem? What is the impact of this work?
3. **Novelty** of the work – How novel the approach used is? Is it a common or relatively unexplored approach?
4. **Code** – How much code has been written by a project team and how much is taken directly from a previous work? Can the results given in the project report be replicated by the code submitted using the instructions given in the README.txt file?

Please make sure that you take particular note of these factors in your final project deliverables.