AI Project Description

50.021 Artificial Intelligence

Group: 3 to 5 members. Register here by the end of week 4.

Informal Project Discussion: Weeks 2-6

Project Proposal Presentation: Week 8

Final Report Due: Monday (11.59pm) of Week 12

Final Project Presentation: Week 13

Deadline permission for custom project: Friday of week 6

Submission: Slides and Report in PDF format and the zip-packed code through eDimension. Attach the code as a separate file outside of the zip, so that we do not need to download hundreds of Megabytes of code only to see the report.

1 Objective

The main objective of this project is to equip and familiarize students with the necessary skills to successfully complete an AI project, including data collection and/or processing, identifying and formulating problems, developing and tuning algorithms and models, designing experimental evaluations and discussing results, scientific writing, presentation and working in teams.

2 Project Overview

For this project, students select and define an AI problem, or choose to work on one of the default projects. Based on their problem description, students then find a dataset(s), implement innovative solutions and evaluate/discuss their results. Students will form a team comprising of 3 to 5 members, and are expected to: (i) organize and participate in their project dicussion; (ii) present an initial project proposal; and (iii) deliver a final presentation and submit a final report.

2.1 Project topic

Event Detection https://github.com/THU-KEG/MAVEN-dataset

DeepFake Detection https://github.com/huangjiadidi/DeepFakeMnist

Fake News / Stance Detection http://www.fakenewschallenge.org/

Custom project Propose your own custom project by the end of week 6. Please obtain our approval before you start.

2.2 Presentation

Student teams will deliver a short presentation of their project (10-15 min), followed by some questions. All team members are expected to present.

During the proposal presentation, please present on **the problem you are working on**, **the dataset(s) you intend to use**, **a brief discussion of the existing works** and **some preliminary ideation of the method/model you intend to develop**.

During the final presentation, please include all of the above (from the proposal presentation) and show either a **discussion/visualisation of your results** or **demonstration of your developed system via a GUI**.

2.3 Final Report

Teams are expected to submit a report of max. 6,000 words, comprising (but not limited to) the following items.

- Clear task/problem description.
- Description of the dataset and of the pre-processing (e.g. how it was split). If applicable, mention any data collection methodology or APIs used.
- Description of your used model and loss.
- Description of your hyper-parameter settings and other experiment settings.
- Evaluation of your model training process through train and test performance, etc.
- Results discussion and, if applicable, comparison with state-of-the-art.
- Description of how to setup your code in order to be able to run the GUI or generate and present the results.
- GUI demonstration or visualisation of results.
- In addendum, please submit your code, including understandable comments within the code.

Tip: you can use Overleaf for easy collaborative writing in LaTeX.

3 Deliverables and Grading

This project is worth a total of 40 marks. For the initial proposal presentation and final project submission, the deliverables and grading of this project is further divided into the following components:

- (Proposal 30% / Final 20%) Description of the problem and dataset; and novelty/challenge of problem, dataset and preprocessing
- (Proposal 40% / Final 30%) Innovative approach to modelling/training; and Implemented models/baselines and description
- (Proposal 0% / Final 30%) Evaluation of the proposed model and baselines; Discussion/Presentation of results and/or GUI (a plus if it is creative); Consideration of the impact of the proposed solution to sustainability, diversity and inclusion, e.g., United Nation SDG: https://sdgs.un.org/goals.
- (Proposal 30% / Final 20%) Quality of the final report as described in Section 2.3; and Clarity of the presentations.

For each of the above categories, some bonus marks may be awarded for teams that perform exceeding well in that aspect (e.g., working on a challenging problem that is interesting and not solved previously, achieving exceptional results over the state-of-the-art, etc).

The project comprises 40 marks out of the entire course. The distribution of project marks and the deliverables are as follows:

- Project Proposal Presentation - 8 marks (Deliverables: Proposal Slides)
- Final Project Report and Presentation - 32 marks (Deliverables: Report, Slides, Codes)

The report is to be submitted in **PDF** format via eDimension outside of the code zip.