COMP6065001 – Artificial Intelligence

FINAL PROJECT DESCRIPTION

ODD SEMESTER 2023/2024

GROUP WORK	:	3-4 Students
CONTRIBUTION	:	30% of Final Score

The main goal of this project to motivate you to think creatively to develop an innovative or unique data science solution based on one of the Artificial Intelligence techniques that you learned during the course. In working on this project you are also expected to develop your coding, teamwork and presentation skills.

The project requires you to:

- Choose any AI problem that can be solved innovatively.
- Develop that innovative/unique AI solution
- Show that your innovative/unique solution works or better than previous approach(es).

Solving a problem innovatively generally means that:

- use **combination** of AI/machine learning methods that are never used before for that particular problem
- you can **extend/improve** the existing AI/machine learning algorithm

You are free to think of any data science problem that you think can be solved with a specific AI technique. The AI technique that you can choose should be one of the following machine learning techniques:

- AI search: BFS, DFS, UCS, Adversarial Search, Genetic algorithms
- Reinforcement learning
- Deep learning
- Natural Language Processing
- Computer Vision

The problems that you want to innovatively solve can be:

- Computer vision applications (e.g. gender recognition from face, etc.)
- A game AI player (e.g. for traditional indonesian games)
- A multi-games AI player
- A problem that you or many people face everyday (traffic, unequal access to information in rural areas, energy conservation, etc.)

- Creative problems (e.g. generating musical composition, visual pattern generator, batik pattern generator, etc.)
- A business problem (e.g. social media trend spotter)
- A problem in computer security area (e.g. malware detection solution, etc.)
- A problem in education domain (e.g. solution for education, etc.)
- A problem in scientific domain (e.g. biology labs, earth monitoring labs, etc.)
- A problem in various domains (e.g. law enforcement, robotics, linguistic, etc.)
- Any problem...

Some sample projects:

- Image classifier or recognition system
- Image assessor application (e.g. good vs bad fruits or other objects)
- Chess player with deep learning
- AI player for Othello and Go
- Network intrusion detection
- Recommendation app (e.g. for restaurant, holiday, music, film, etc.)
- App to chat with human users (can be in any domain and not only for serious conversation)
- System to generate pictures or patterns (e.g. batik)
- Automatic music generator
- Automatic coloring book

You can also get the project idea from the internet but you need to modify either the problem or the solution (either using different algorithms or extending the algorithm).

Solution Implementation Instructions

You may work in group of minimum 3 persons and maximum 4 persons. The job division among group members should be clear from the beginning. Each student will get an individual mark, so you can get a different mark from your group members.

Your solution can be a game, a simulation, or in other forms (e.g. web or mobile applications). You are recommended to implement the solution using Python and relevant libraries or frameworks, and use a GIT repository.

Please mark or put references to all things (code, pictures, methods, etc.) that you use from external sources for your project. So please indicate clearly in your code, the things that you write yourself and the things that you take from external sources. As a guideline, please do not use more than 60% of your code from external sources.

Marking guide for the project

The project will be marked using the following marks breakdown:

Marking Components	Marks
Understanding of AI principle	25
Understanding of basic mathematics	25
Code implementation	25
Teamwork collaboration	25
Total	100

What to Hand In

Hand in a project report (minimum 5 pages and maximum 20 pages single space, 12pt) using MS Word or Overleaf/Latex template file (template will be provider later). The report should contain:

1. Problem description
2. Solution features, e.g. algorithms used, special technologies used, user interface, etc.
3. Solution design architecture
4. Experiments or tests that you have done.
5. Program manual (with screenshots)
6. Link to video of the application demo (with max. length of 2 minutes)
7. Link to your GIT repository

Remember to document your code properly (internal documentation).

To submit your project, each student is required to provide the following information:

- Email
- Class
- Full name
- Student ID
- Full names of the team members
- Report (file or link)
- Video demonstration (file or link)

OPTIONS to publish your paper

You are given optional choice to publish an outstanding project to an international conference. In order to be eligible to take this option as the replacement of written - examination, the students need the approval from the lecturer.

With an intensive guidance from the lecturer, you will need to do:

1. Revise the content to match with academic style
2. Convert the documentation format

3. Submit to the relevant international conference
4. Attend and present in the international conference (All the registration will be paid by BINUS)

Additionally, there might be extra sessions of “Basic Academic Writing”, in order to be able to publish a paper. The schedule of the sessions will be informed later.