SINGAPORE POLYTECHNIC
CC2003 Artificial Intelligence and its Impact

CA2 – AI × SDG
"How can AI help in achieving the Sustainable Development Goals?"

Group Assessment
(70% weightage)

A. Objectives

This assessment evaluates your ability to:
1. Identify an application (or a potential application) of AI for good, in particular to address one of the United Nations Sustainable Development Goals (SDGs)

B. Introduction

Artificial Intelligence (AI) has a lot of impacts on our lives. Yes, AI has some negative impacts. It has the potential to disrupt jobs. It may violate your privacy. It may cause socioeconomic inequality. However, AI also has a lot of positive impacts, helping us make the world a better place. In the global attempts of achieving sustainability, and more notably, meeting the UN Sustainable Development Goals (SDGs) and Singapore's Green Plan, AI can become a powerful weapon towards a circular economy and more sustainable living. (More details on AI + SDG here.)

In fact, the McKinsey Global Institute has collected about 160 cases of AI's real or potential uses that could benefit society non-commercially, with technologies like natural language processing (NLP), deep learning, computer vision, machine learning, and others, making a significant difference. (Source here.)

The current AI capabilities could help solve cases across all 17 of the SDGs, eventually benefiting hundreds of millions of people in both advanced and developing countries. Helping blind people navigate their environment, identifying victims of sexual exploitation online, and supporting disaster relief efforts, such as the flooding that followed Hurricane Harvey in 2017, are just some examples where embracing new technologies and innovation can help. Moreover, AI-powered wearables can help detect the early stages of diabetes and help detect skin cancer through image scanning.

As one of the most emerging technologies, AI will have a great impact on our future actions. According to Grand View Research, the global AI market was estimated at $39.9 billion in 2019 and is projected to grow at a compound annual growth rate (CAGR) of 42.2% from 2020 to 2027. This rapid growth means that the technology will enter many segments of how the world works, including achieving sustainability. (Source here.)

C. Assessment Brief

CA2 is a **group** assessment. Your group should comprise 4 or 5 members **(5 preferred)**.
This module CC2003 AI and its Impact (AII) is paired with another CCC module CC1007 Collaboration in the Digital Age (CDA). You will work in the same teams of 4 or 5 as in your CDA project.

In this part of the assessment, you are going to apply what you have learned in this module, and your own interests, to prepare **an oral presentation** on an application of AI (or a potential application of AI) for achieving SDG.

D. Submission Deadline

You are to deliver the oral presentation on **Week 6 lesson**.
Details of the submission can be found below.

E. Detailed Instructions

Here are steps that you can take to accomplish CA2:

1. Identify **one** problem / issue your group is passionate about (can be local / global).
    This problem **must** be related to one of the 17 SDGs:

2. Research and explore how AI can be applied to address the problem that you have chosen. Because AI is an emerging field, sometimes you can find an existing application of AI (already widely implemented), but some other times you may find interesting ideas / scenarios in which AI can potentially be applied. Both are acceptable in this CA2.

3. Be sure to include the following:
    a. Research problem statement
    b. How the AI application works
    c. How this impacts / benefits users

Research problem statement (General Aspect)

- ❑ State the problem / issue you have chosen.
- ❑ State and justify which SDG and target(s) the problem relates to.
- ❑ State the urgency of the problem: why that problem is critical to solve, what the consequences are if the problem remains unsolved, etc.
- ❑ State the name and the general aim of the AI application.
- ❑ Cite the references used clearly in the presentation.

How the AI application works (Technical Aspect)

- ❑ How does the AI application work? Describe briefly, and use flowcharts or diagrams to illustrate if necessary.
- ❑ Is the AI application using Machine Learning? If so, what type of ML technique is it? (classification, regression, clustering, reinforcement learning)
- ❑ Which part of the AI application is "intelligent"? (Intelligent = learn, think, behave like humans)
- ❑ What kind of data is needed for the AI application to work?

How this impacts / benefits users (Social Aspect)

- ❑ How will the AI application benefit users?
- ❑ Are there any concerns if the AI application is widely used?
- ❑ Are there any bias or privacy issues? Are there other ethical issues?
- ❑ Any other positive / negative impacts of the AI application can be addressed.
- ❑ How does the AI application address the SDG problem that you have identified?

Important: **Back up all your statements with facts and data, rather than "general statements that are hypothetically true".** ❗

4. In group, prepare a presentation addressing the above points.
   The presentation has the following requirements:
   a. Duration of presentation: <u>max</u> **10 minutes per group.**
      All group members must have a speaking role.
   b. Presentation will be followed by **Q&A.**
      Duration of Q&A: **2 minutes per student.**
      Each student must respond to at least one question.
   c. Time limits for presentation and Q&A will be strictly enforced.
      Rehearse and prepare well for the presentation.
   d. The use of slides is **compulsory**, and there are no restrictions on the number of slides

5. Submit the completed deck of slides in Brightspace **before** the start of your CA2 presentation in Week 6 (i.e., if your CA2 presentation is on Week 6, Monday, 8.00 - 10.00 a.m., CA2 slides must be submitted by 8.00 a.m.). Only <u>one</u> member needs to submit on behalf of the group.

F. Getting Started

We list some useful resources here for you to get started:

1. A short intro on each of the 17 SDGs: https://www.youtube.com/watch?v=TfOJ7HNo-qE&list=PLbLm7JxAJLIA-styxAarUbG77BBk4itbw&index=1
2. AI for Good: https://ai4good.org/ai-for-sdgs/
3. AI for Sustainable Development Goals (AI4SDGs) Think Tank: https://ai-for-sdgs.academy/
4. SDG AI Lab: https://sdgailab.org/
5. Sustainability for all: https://www.activesustainability.com/sustainable-development/the-alliance-between-artificial-intelligence-and-sustainable-development/?_adin=02021864894
6. McKinsey Global Institute "Applying artificial Intelligence for social good": https://www.mckinsey.com/featured-insights/artificial-intelligence/applying-artificial-intelligence-for-social-good
7. 2030Vision's paper "Artificial Intelligence and the Sustainable Development Goals: The State of Play": https://assets.2030vision.com/files/resources/resources/state-of-play-report.pdf
8. Nature paper "The role of artificial intelligence in achieving the Sustainable Development Goals": https://www.nature.com/articles/s41467-019-14108-y
9. United Nations resource guide on AI strategies, Jun 2021: https://sdgs.un.org/sites/default/files/2021-06/Resource%20Guide%20on%20AI%20Strategies_June%202021.pdf

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G. Assessment Rubric (max 100 marks)

The following rubric is used for submitted attempts, within deadline.

CONTENT (GROUP)	Poor	Fair	Good	Very Good	Outstanding
General aspects are clearly mentioned: • problem statement • SDG#, target# • urgency of the problem • name and general aim of AI application	0-12	13-15	16-18	19-21	22-25
Technical aspects are clearly mentioned: • how AI application works • type of ML technique • why it is considered "intelligent" • data needed	0-12	13-15	16-18	19-21	22-25
Social aspects are clearly mentioned: • how AI application benefits users • concerns (privacy, bias) • ethical issues • positive / negative impacts	0-12	13-15	16-18	19-21	22-25
Q&A (INDIVIDUAL)	**Poor**	**Fair**	**Good**	**Very Good**	**Outstanding**
Student shows ability to respond clearly to questions related to project or individual contribution	0-12	13-15	16-18	19-21	22-25

Late Penalty for Oral CA

You are expected to be punctual for your oral CA. You will have 10 marks deducted from your awarded marks if you arrive after the start of your assigned timeslot.

Absence from Oral CA

It is your responsibility to contact the lecturer and team members should you miss the oral CA. You must have a valid Leave of Absence (LOA) from your school before a make-up assessment can be considered. **As CA2 has 70% weightage in the module, you will fail the module if you are absent without LOA.**

Teamwork Challenges

The team will be graded collectively for the team component and every member will be awarded the same grade. If you have completed CC1X07 CDA: Collaboration in the Digital Age, you are expected to apply the teamwork skills you have learnt from the module to ensure efficient and effective collaboration.

H. Important: Use of AI tools

The use of any AI tools, including ChatGPT, is allowed. Learning to use AI is an emerging skill. However, the onus is on you to ensure the final presentation is credible.

Be aware of the limits of AI tools such as ChatGPT:

- Do not trust anything it says. If it gives you a number or fact, always assume it is wrong unless you verify the answers and check in with another source. You will be responsible for any errors provided by the tool.
- If you provide minimum prompts, you will get low quality results. You will need to refine your prompts in order to get good outcomes. Feel free to experiment!

Ensuring academic integrity

At the end of the slides, include the following:

- Cite your references clearly (ensure they are all relevant, credible and clickable)
- Do acknowledge if you use any AI tools. Use the following template:

Name of AI tool	*< For example, ChatGPT >*
Input prompt	*< Insert the question that you asked ChatGPT >*
Date generated	*< Insert the date that ChatGPT response was generated >*
Output generated	*< Insert the response verbatim from ChatGPT >*
Impact on submission	*< Briefly explain which part of your submitted work was ChatGPT's response applied >*

- Declaration of academic integrity. Use the following template:

Declaration of Academic Integrity
Academic Integrity is a central tenet of Singapore Polytechnic. The polytechnic rules state that "*Cheating in examinations and other assessed work is a very serious offence. This includes copying and using plagiarised material. Any student who cheats, attempts to cheat or breaches any rules for examinations and tests will face disciplinary action. The student is liable to be expelled.*"

Check only one of the two options below:
☐   I affirm that the work I produced and submit is my own, with no help from any AI tools.
☐   I affirm that the work I submit has been produced with full integrity, and that I have acknowledged the use of AI tools.

By signing this form, I declare that the above affirmation made is true, and that I have read and understood the rules stated in Students Handbook on "Plagiarism" and "Breach of Examination/Assessment Rules".

Name: _____
Student ID: _____
Signature: _____
Date: _____