National University of Singapore
School of Computing

Semester 2, AY202425

CS3263 Foundations of Artificial Intelligence

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Project Guidelines

Important Dates

- **Project Proposal Submission:** Monday, 3 March 2025
- **Project Presentation:** Week of 14 April 2025
- **Project Report Submission:** Thursday, 17 April 2025

Project Team

You will work in teams of **3-4 members**. Each member is responsible for the team's overall success. Choose your teammates carefully to ensure effective collaboration.

Project Topic

The project is a key component of this course, allowing you to explore AI in greater depth.

Choose a topic from one of the two themes below or propose a related topic covered in the course. Ensure your project incorporates **relevant course materials** and includes considerations for **responsible AI**:

- **AI Assistant for X** (e.g., education, finance, well-being, elderly care, customer service, etc.)
- **AI for Good** (e.g., health, education, sustainability, climate change, ESG considerations)

Project Types

You may choose **one** of the following project types:

1. **Exposition Project:**
    - Analyze a significant AI framework, algorithm, or application (e.g., AI assistants based on ChatGPT, Llama, Bard; mission planning for Mars Rovers; the AlphaGo family; hierarchical reinforcement learning in online strategy games).
    - Explain AI methods, underlying mechanisms, challenges, significance, and provide a **small demonstration** (e.g., comparing published results, reproducing findings, or running new experiments based on existing code).

2. **Application Project:**
    - Define an AI problem within the themes.
    - Apply or extend AI techniques in advanced search, probabilistic modeling, logical inference, hybrid knowledge representation, generative models, or decision systems (MDP, RL, decision analysis).
3. **Competition Entry:**
    - Solve an AI task within a common domain.
    - You don't need to enter a competition, but you must demonstrate how an AI controller can be applied or extended in a simulation environment. (See examles resources below)
4. **Theoretical/Methodological Research (for "brave souls")**:
    - Develop a new AI algorithm or propose an innovative technique (e.g., integrating Bayesian networks with neural networks, combining knowledge graphs with causal inference, improving decision analysis, studying advanced search properties).
    - *If interested, discuss UROP or PhD opportunities with me.*

Project Requirements

The project contributes **25%** of the final grade. Assessment is based on **the report and presentation**, but a proposal must be submitted to receive a grade.

a. Project Proposal[1]

- **Length:** Maximum **1 page**, single-spaced, single-column, 1-inch margins (excluding title page & references).
- **Content:** Clearly outline your plan (not detailed specifics), providing background, problem statement, approach, team roles, deadlines, and risk assessment.
- **Submission:** Upload via **Canvas** with all team members' names, metric numbers, and email addresses.
- **Grading:** The proposal is **not graded**, but feedback will be provided.

b. Project Presentation

- **Duration:** ~15 minutes + 5 minutes Q&A (*subject to change*).
- **Format:** Present to the class or submit a recorded presentation if required.

[1] Feel free to start preliminary discussion on your topic in the discussion forum before the proposal deadline

c. Project Report

- **Writing Standard:** Academic, technical report.
- **Length:** Maximum **10 pages**, single-spaced, single-column, 1-inch margins (excluding title page & references). All important discussions, figures, tables, and materials must be included. Additional details (e.g., probabilistic graphics models, screenshots) can be placed in an appendix.
- **References:** Use a **Reference Manager** (e.g., Endnote, Zotero, Mendeley) and follow **Vancouver citation style**.
- **Submission:** Upload **PDF** via **Canvas** with all team members' details.

Audience

Your proposal, report, and presentation should be understandable to a **technical audience** familiar with AI but not necessarily your specific topic (e.g., classmates).

Collaboration

- Clearly define team roles in both the proposal and final report (*adjustments from the proposal are acceptable*).
- Ensure all team members understand the entire project.
- **DO NOT** copy-paste or merely rephrase printed/online materials.
- Cite all sources properly.
- If using ChatGPT or other LLMs, specify your contributions vs. AI-generated content. You won't be penalized for AI use, but transparency is required.

Grading Criteria[2]

Your project will be graded on:

- **Report:** Organization, difficulty, achievement, soundness, innovation, clarity.
- **Presentation:** Organization, clarity, and ability to answer questions.

Best Project Award

The best project will receive a **mystery prize** at the end of the course!

Information Resources

- Some example competition sites are as follows[3]:
  - ML Contests: https://mlcontests.com/,
  - AI Lux Challenge Season 3: https://neurips.cc/virtual/2024/competition/84798 and https://www.kaggle.com/competitions/lux-ai-season-3
- A list of relevant information repositories is provided HERE.
- For data sources, try to access public available datasets or APIs.

[2] Refer to the Appendix for detailed evaluation criteria.
[3] You don't have to actually enter the competitions, just make use of the programming environments

Appendix: Project Evaluation Guidelines

- Problem Understanding and Formulation
    - Motivation and rationale
    - Problem definition
    - Innovativeness
- Knowledge and Technical Depth
    - Relevance and significance
    - Accuracy of knowledge applied
    - Level of achievements
- Methodology and Results
    - Methodology
    - *Literature survey and prior work (if applicable)*
    - *Implementation (if applicable)*
    - Analysis and insights
- Effort and Initiative
    - Evidence of effort
    - Evidence of independent and teamwork
    - Contributions of team members clearly stated
- Report
    - Relevance of content
    - Organization
        - 10-page length strictly enforced
    - Writing style
- Presentation
    - Relevance of content
    - Organization
    - Clarity
    - Time management
    - Q&A