

# Artificial Intelligence (IT3160E)

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# Course structure

- Number of weeks: 16

- Lectures: 12 – 13 weeks
- Capstone project report: 3 – 4 weeks

- Time and location

- Wednesday, 12:30-15:50; Building D9, Room 407

- The course's folder

*<https://users.soict.hust.edu.vn/khoattq/lectures/IT3160E-AI/>*

- Question + Advice:

- E-mail: [khoattq@soict.hust.edu.vn](mailto:khoattq@soict.hust.edu.vn)
- Building B1, Room 706

# Syllabus

- Introduction of artificial intelligence
- Intelligent agents
- Problem solving: Search, Constraint satisfaction
- Logic and reasoning
- Knowledge representation
- Machine learning

# Course objectives

- Help the students have knowledge of:
  - ❖ The basic *concepts* in Artificial Intelligence
  - ❖ The basic *problems* and *methods* in Artificial Intelligence
  - ❖ The *applications* of Artificial Intelligence in practice

# Evaluation

- Capstone Project (**M**): Maximum 10 points
  - Each project will be done by a group of 3-4 students
  - The topic for a project can be chosen freely, and should closely relate to intelligent systems
  - Build a demo of an AI-based system
- Final exam (**F**): Maximum 10 points
- Course mark (**G**):  $\mathbf{G} = 0.4 \times \mathbf{M} + 0.6 \times \mathbf{F}$

# Capstone Project

- Students work in groups, each consists of 3-4 students.
- Each group choose a problem/topic which should closely relate to intelligent systems
- Each proposal should be precisely described
  - The problem: short description, future application, ...
  - The algorithms or tools, planned to be used
- **Project registration: before 11/05/2022**
  - Via Google Form (TBA)

# Project examples: basic

- Build an intelligent system to solve a real-life problem, using one method from AI. For example:
  - Chess, using an intelligent strategy (e.g., A\*, Minimax,...)
  - Build a demo of an AI-based system
- Build a machine learning system to solve a real-life problem. For example:
  - Categorizing webpages, emotion detection from text,...
- **Note:** Caro is not accepted in this semester

# Project examples: challenging

- Build an intelligent system to solve a real-life problem, using modern technologies from AI. For example:
  - Chess, using deep neural networks
  - Image/music generation
  - ...
- Evaluate a modern models or methods. For example:
  - Transformers for image classification
  - BERT for sentence representation
  - ...



# Capstone Project: requirements

- The result will be presented in the ending period of this subject. Every member is required to contribute to his/her project.
- Project report:
  - **Source code:** save your code into one zip file
  - **Readme.txt:** describes clearly how to setup and run your code
  - **Written report:**
    - Introduce the problem to be solved
    - Details about the methods for solving the problem
    - Results of different evaluations, new conclusions/findings, ...
    - The main components of your code
    - The difficulties in this project, and your proposed solution
    - ...

# Capstone Project: evaluation

- The evaluation of each project will be based on
  - The difficulty of the problem of interest
  - The appropriateness & quality of the chosen method/solution
  - The rigor of your evaluation on the chosen method/solution
  - The quality of the written report
  - The quality of the presentation
- Each project will have 15' for slide presentation & demo
- **If you use some existing libraries/packages/codes, you have to clearly declare your usage in the written report and slide presentation**

# Course materials

- Lecture slides

- Reference books

- S. Russell and P. Norvig. *Artificial Intelligence: A Modern Approach (3rd Edition)*. Pearson, 2009.
- T. M. Mitchell. *Machine Learning*. McGraw-Hill, 1997.