



Machine Learning and Robot Car Auto-piloting (E3ROB001C)

Introduction

This is a full path and practical Machine Learning course.

Starting with mathematic fundamentals and then via hands-on experiments and coding with C++, students will walk through the full path of Machine Learning in Artificial Intelligence (AI) programming. They will also program a robot car in Blockly to collect movement data. After model training, testing and prediction on computer, the ultimate goal is to perform auto-piloting using Machine Learning.

Installed with a video camera and fast turning wheels, the robot car can be turned into an auto-pilot car using computer vision technology and AI. The course will be wrapped up by applying Google TensorFlow with Keras in Python on the same project, so that students can experience more recent frameworks of AI.

Programme Type / Level

Robotics Course (Level III) ([Token-required](#))

Instructor(s)

Mr LAU Kam Ming, Erwin (Smart Kiddo Education Limited)

Pre-requisite

- Linear Algebra;
- Fundamental knowledge in Robotics;
- Experience in any form of computer programming;
- Students are highly recommended to bring their own PC/Mac laptops for the largest benefits from the course;
- The student has security right to install software onto the laptop brought along.

Target Participants

- S1-S6 HKAGE student members only in 2020/21 school year
- Class size: 30

This programme is the same as Intermediate Course in Artificial Intelligence and Machine Learning: Machine Learning and Its Application (TECS2131) in 2019/20 school year.

Medium of Instruction

English with English Handouts

Certificate

E-Certificate will be awarded to participants who have:

- ❖ Attended **AT LEAST 5** sessions AND
- ❖ Completed all the assessments with satisfactory performance.

Intended Learning Outcomes

Upon completion of the programme, participants should be able to:

- understand the mathematical concepts of Machine Learning;
- collect training data through first-hand robot coding and controlling;
- build up a neural network to perform model training with collected data;
- perform prediction and testing by real-life robot car;
- compile code of ethics for Machine Learning technology.

Screening

Please answer the screening question in the online application form.

*The screening question is designed to help the applicant understands the course level and the course content. The question must be answered by the student applicant and it can only be attempted once. The answer cannot be changed once the application is submitted. Selection is based on students' performance in answering the question. Only students who can demonstrate motivation and the knowledge of robotics in the screening question can be enrolled in the programme.

Application
Deadline

17 May 2021,
12:00 n.n

Application Result
Release Date

28 May 2021

If student members withdraw from the programme after the Application Deadline, the token will be deducted.

Schedule

Session	Date	Time	Venue (HKAGE)
1	9 Aug	9:30 a.m. – 12:30 p.m.	Room 303
2		2:00 p.m. – 5:00 p.m.	
3	16 Aug	9:30 a.m. – 12:30 p.m.	
4		2:00 p.m. – 5:00 p.m.	
5	23 Aug	9:30 a.m. – 12:30 p.m.	Room 105
6		2:00 p.m. – 5:00 p.m.	

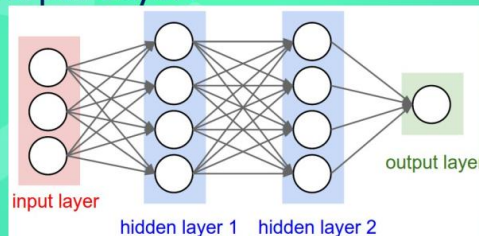
Sample Notes

Let's play a Guessing Game

- Guess what is the correct answer:
 - $3 \odot 2 = ?$ **4**
 - $4 \odot 2 = ?$ **5**
 - $5 \odot 2 = ?$ **6**
 - $5 \odot 3 = ?$ **12**
 - $4 \odot 3 = ?$ **10**
 - $3 \odot 3 = ?$ **8**
- How do you reach this answer?
- Can you think of a "simple" operation and make me guess?

Basic Neural Network

- One Input Layer.
- One or more Hidden Layer(s).
- One Output Layer.



Enquiries



For enquiries, please contact Academic Programme Development Division on 3940 0101, after language selection, press "1".