THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學
Opening Minds • Shaping the Future • 啟迪思維 • 成就未來

FACULTY OF ENGINEERING
工程學院
WHERE CONCEPTS BECOME REALITY

STEM Workshops for Secondary School Educators

Workshop 1: 15 August 2019 (Thu)
Machine Learning for Object Recognition and Tracking
Presented by Department of Mechanical Engineering

This workshop will cover the basics of machine learning and artificial intelligence for object recognition. In the first part of this workshop, participants will learn the concepts of how a machine (system) can detect objects in a new image and perform real-time object tracking. In the second part of this workshop, participants will have an opportunity to apply different algorithms for object recognition and tracking through hands-on laboratory exercises.

Workshop 2: 16 August 2019 (Fri)
Basic Bionic Hand Control and Biosignal Measurement
Presented by Department of Biomedical Engineering

This workshop will cover the basics of biosignal measurement for controlling a simple bionic hand. In the first part of the workshop, participants will learn how to use various sensor technologies to measure 1) human motion data; 2) electrical data from muscle contraction, and 3) brain waves. In the second part of the workshop, participants will learn how to process the biosignal to control the movement of a simple bionic hand.

Workshop 3: 22 August 2019 (Thu)
Overview of Artificial Intelligence and Machine Learning
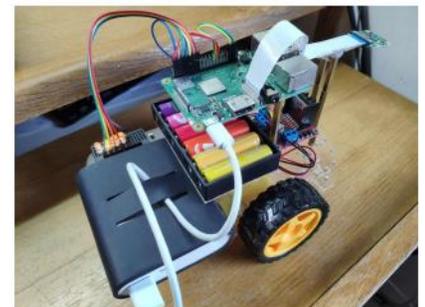*Presented by Department of Computing*

This workshop will provide an overview of artificial intelligence, machine learning and deep learning. Hands-on exercises will be provided to visualize data, develop and evaluate predictive models using tools such as Orange, Watson Studio and Python/R.

Workshop 4: 23 August 2019 (Fri)
Build an AI Robotic Car: Hardware and Software Integration
Presented by Department of Electronic and Information Engineering

This course will show you how to build a robotic car with an AI (Artificial Intelligence) image recognition algorithm. The outlook of the robotic car is shown below. A webcam is connected to a microcontroller of the car. It captures the image of a handwriting character and recognises it. Then the robotic car moves according to the recognition. The powerpoint to introduce the principle of the image recognition algorithm and the complete guideline to build the robotic car will be given in the course. Moreover, an item list to show all components of the robotic car and a demonstration video to build the car will be also given.

Workshop 5: 21 August 2019 (Wed)
Basic Control and Robotic Applications
Presented by Department of Industrial and Systems Engineering

This short course will focus on the developments of basic control/monitoring techniques and robotic applications. The main aim is to facilitate the secondary school educators to gain some fundamental knowledge in areas of automation and robotics. A series of hand-on exercises will be provided and the contents cover both hardware and software applications.