

Gifted Education Fund: Off-school Advanced Learning Programmes

Title of Programme	To Learn AI-based Real Problems Solving Skills in a Playful Environment for Gifted Students
Programme Provider	Department of Computing and Decision Sciences, Lingnan University
Theme	STEM-related Mentorship Programme
Maximum No. of Participants and Class Level in the 2020/21 School Year	30 students (Primary 2-4)
Pre-requisite	Applicants should possess basic computer programming knowledge.
Programme Duration	About 10 months
Medium of Instruction	Course Material: English Class teaching/ Discussion: English supplemented with Cantonese
Objectives	<ul style="list-style-type: none"> • To equip gifted students with the knowledge and skills of creating machine learning models through the application of computer games; • To enable the students to apply Artificial Intelligence to solve real-world problems in a playful environment by using an innovative education model; and • To nurture positive values and attitudes among students so that they would gain perseverance in facing adversities and problems
Programme Outline*	<p>This programme aims to equip gifted students at the primary level with the knowledge and skills of creating machine learning, and nurture positive values and attitudes such as perseverance in facing adversities and problems. The programme consists of three phases.</p> <p>Phase I</p> <ul style="list-style-type: none"> • Small-class teaching (12 meetings, 1 hour each) on 5 topics for students to acquire basic knowledge and skills of machine learning including how to train a computer to recognize numbers, images, texts, sounds and also to control a coding education robot. Each student will hand in a self-designed control system of a coding education robot and a summary of the system by the end of this phase. <p>Phase II</p> <ul style="list-style-type: none"> • Hands-on projects (16 meetings, 1 hour each) related to image recognition system design, implementation and testing. Students will first study a sample Python programme and learn

how to train the model to differentiate, for example, a cat and a dog. They will then modify the programme and extend its functions to cover other objects. By the end of this phase, each student will hand in the designed image recognition system and a summary of the functions of the system.

Phase III

- Hands-on projects (12 meetings, 1.5 hour each) related to real-world applications of machine learning. Sample programmes, e.g. face recognition, will be introduced to illustrate how machine learning can be applied in daily life such as unlocking a mobile phone. Students will work in groups, apply machine learning technology and make use of their creative thinking to build AI models for real-world tasks. Students will submit a designed model, a relevant summary report and give a presentation in groups by the end of the programme.