Python &
Artificial Intelligence

AGES 12+

PYTHON & ARTIFICIAL INTELLIGENCE

1 : Game Programming

2 : Ai- Vision & Speech

3 : Ai Raspberry PI

The Ultimate Programming Curriculum for Future AI

The Python & AI curriculum introduces Python programming through game development before moving onto Artificial Intelligence (AI) courses. Like all Exceed Robotics curriculums, programming concepts and languages are taught through relevant applications - Python is the leading coding language for Big Data, Advanced Robotics and Artificial Intelligence.

Higher level courses move onto programming for image manipulation, object detection and text to speech before integrating these elements in a final AI project. The end goal of this program is to teach Python towards creating advanced devices with Artificial Intelligence

PROGRAM DETAILS

20-month curriculum (in-centre)
8-month curriculum (online)

Classes once per week classes

One-hour in duration

6 max students per class

The Python and Artificial Intelligence curriculum was created by a team of software engineers working in the tech industry, with years of experience in teaching and course development. The program's vision is to create a community of young innovators by developing relevant computer science & engineering skills with industry-related experience to kickstart their career in STEM

GAME PROGRAMMING

PY-01: INTRODUCTION TO PYTHON GAME PROGRAMMING

Prerequisite: ages 12+ (no experience required)

Designed to introduce student to coding in Python through a fun application - Game Programming. Students learn programming fundamentals using an object-oriented language. Concepts such as variables, if statements, while loops, mouse input, and basic shapes are taught in the first course. Students complete the course by creating a simple game with Python.

```
# Guess the Number
# Programmed by Zachary Fruhling
# Copyright 2020

import random
correctAnswer = random.randint(1, 100)
gameOver = False

while gameOver == False:

    playerGuess = int(input("Guess a number between 1 and

    if playerGuess == correctAnswer:
        compareAnswer = "Right"
        gameOver = True
    elif playerGuess > correctAnswer:
        compareAnswer = "High"
    elif playerGuess < correctAnswer:
        compareAnswer = "Low"

    if compareAnswer == "Right":
        print("Correct! You Win!")
    elif compareAnswer == "High":
        print("Too High! Guess Again!")
    elif compareAnswer == "Low":
        print("Too Low! Guess Again!")
```
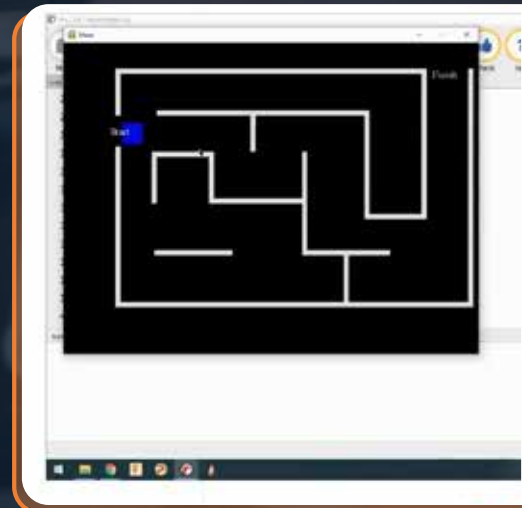
PY-02: GAME PROGRAMMING FUNDAMENTALS I

Prerequisite: PY-01

Students are introduced to more advanced concepts including Functions, Lists and Keyboard input. Thematerial covered in this course could be extended to any object-oriented programming language andserve to advance our game development skills. Students will complete the course by creating a newgame applying the learned fundamentals

PY-03: GAME PROGRAMMING FUNDAMENTALS II

Prerequisite: PY-03

Our third game programming course focus es on one of the most important concepts of object oriented programming classes. Classes play a big role in game programming by simplifying code and have extensive uses in non game programming applications. Students will create several games throughout this course to better understand and practice this concept.

PY-04: GAME PROGRAMMING APPLICATION

Prerequisite: COD-03

The final Game Programming course has an open project to provide students with the opportunity to apply the learned concepts for programming a game on their own.

Students receive a project outline with game requirements and options to make the game more interesting. At the end of this series of courses, students would have built a solid understanding in programming and coding in Python.

PY-05: IMAGE PROCESSING

rerequisite: PY-04

We start the first of the Artificial Intelligence courses with Image P rocessing . In this first course, students will learn how to manipulate an image in prepar ation for object detection using various AI tools .students will practice image manipulation including resizing , rotation, scaling and applying filters to images to highlight ar of interest for image recognition.
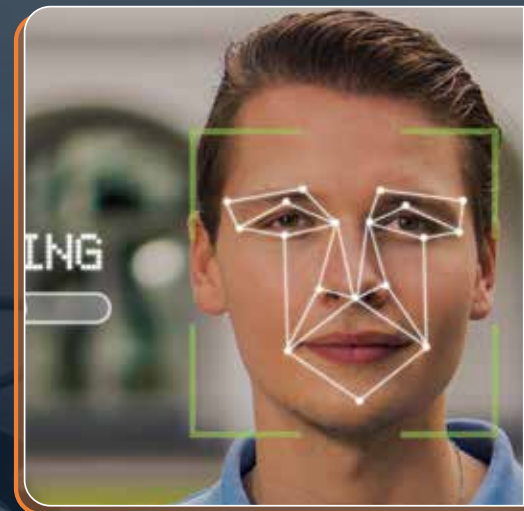
PY-06: AI OBJECT DETECTION

Prerequisite: PY-05

Through writing programs to detect colours and recognize traffic signs, students learn how to create their own AI applications. In this course, students will use APIs to create simple object and colour detection programs. Programming sills learned in these two image recognition courses will prove useful in developing AI apps in future cours es

PY-07: AI SPEECH RECOGNITION

Prerequisite: PY-06

Speech recognition and text to speech (TTS) are twoof the main applications of AI in most smartdevices . Students will learn how to create programs to listen to a user and understand words and sentences.

They will also learn how to convert written text by users into audio sentences. Combining image and speech recognition, We are ready to proceed to building AI applications!

PY-08: INTRODUCTION TO RASPBERRY PI

Prerequisite: PY-07

Students will be introduced to the Raspberry Pi and program & build applications using Python. Raspberry PI is a complete computer that costs less than $100 and could execute Python code. It can be equipped with a camera, microphone and speakers and has built-in Wi-Fi. All this capability inside a device that fits in your pocket.
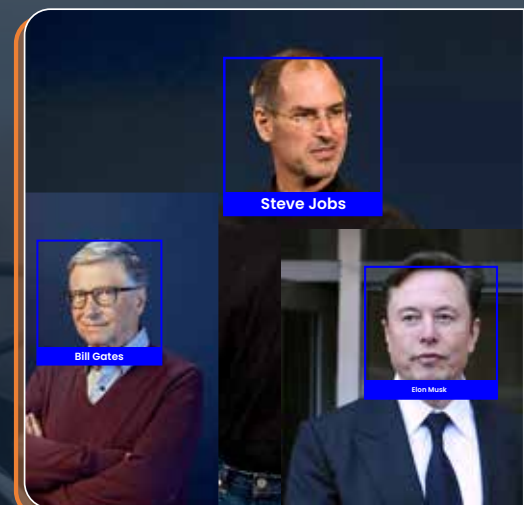
PY-09: RASPBERRY PI CAPSTONE PROJECT I

Prerequisite: PY-08

The final two courses in Python curriculum integrate Python with Raspberry PI to create an AI device . The class will be given a choice of high tech applications similar to Siri, Google Assistance, Alexa, security c amera system with motion detection , etc Students will work with the instructor and utilize online resources to create and execute a project of their choice

PY-10: RASPBERRY PI CAPSTONE PROJECT II

Prerequisite: PY-09

Students continue working to complete their Capstone Projects which will be submit ted at the end of this course for graduation At this point student s are fully capable of creating simple to medium complexity AI devices using Python and Raspberry Pi. During graduation, students will receive their diploma in Python & Artificial Intelligence!
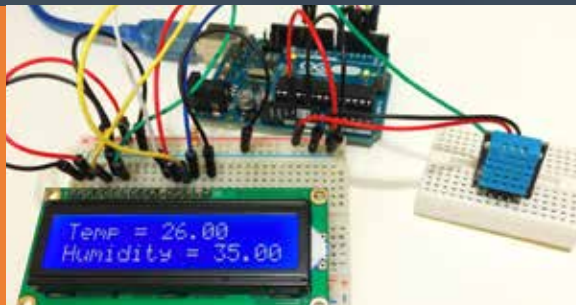
What's Next?

ALUMNI WORKSHOP

A project-based environment where students apply their learned skills and work on their own creations (products, programs and apps) under the supervision of a workshop manager. Ideal for students who are interested in working on their own ideas and projects.

ARDUINO MICROCONTROLLERS

Learn to create electronic circuits and program the Arduino microcontroller to create your own robots. Ideal for students who are interested in created programmable devices and robots.

MECHANICAL DESIGN & 3D PRINTING

Learn mechanical design using Fusion 360 and create your own parts using a 3D printer. Ideal for students who are interested in learning how to create custom mechanical parts for their projects.

INTERNET OF THINGS (IOT)

Coming Soon!