NANYANG POLYTECHNIC

School of Engineering

IoT System Development (EGL201)

Project Instructions (30%)

1) All projects are individual project. There are **NO group projects** due to safe distancing measures.

2) Each student needs to select **5 choices** from the list of projects below and send an email to your module tutor regarding your preference **latest by end of Week 8**.

3) The email addresses of your module tutors are below:

Module Group	Module Tutor's Email Address
L1	foo_yong_wee@nyp.edu.sg
L2	ng_kok_poh@nyp.edu.sg
L3	Charles_Oh@nyp.edu.sg
L4	Paul_Loh@nyp.edu.sg
L5	nai_song_boh@nyp.edu.sg
L6	kor_hian_loon@nyp.edu.sg
L7	wilson_huan@nyp.edu.sg
L8	seah_ban_wah@nyp.edu.sg
L9	jlaush@yahoo.com

4) Your module tutor will assign you the projects on a first-come-first-serve basis. You need to send an email to your module tutor on your 5 choices once you have decided on the project that you are intending to do.

5) You will need to sign out those additional hardware that are highlighted in **RED** in the project list.

6) Your project assessment (starting from Week12 to Week17) will include a **5 minutes presentation with a project demo and Q&A**. You are limited to **5 Powerpoint slides** for your presentation.

Project List

A) Raspberry-Based Projects

Project No.	Title	Reference	Hardware Needed
1	Motion Tracking with Raspberry Pi	https://www.hackster.io/iulianrusu2/motion-tracking-with-raspberrypi-7692da#	• Raspberry Pi • **Resistor 330 ohm (1)** • LED (1) • **Pi camera**
2	Image Recognition Using TensorFlow and Raspberry Pi	Get Started With Image Recognition Using TensorFlow and Raspberry Pi (makeuseof.com)	• Raspberry Pi • **Pi camera**
3	Amazing Image Identifier	Amazing image identifier - Introduction | Raspberry Pi Projects	• Raspberry Pi • **Pi camera**
4	A Raspberry Pi laser tripwire	https://projects.raspberrypi.org/en/projects/laser-tripwire/1	• Raspberry Pi • **1µF capacitor** • **Photoresistor** • Torch light or laser pointer • Drinking straw
5	Sense Hat music player	Sense HAT music player - Introduction | Raspberry Pi Projects	• Raspberry Pi • Sense HAT • **Speaker/headphone**
6	Raspberry Pi Weather Station using the Sense HAT	Raspberry Pi Weather Station using the Sense HAT - Pi My Life Up	• Raspberry Pi • Sense HAT
7	Raspberry Pi Servo Motor Control through a Webpage using Flask	Raspberry Pi Servo Motor Control through a Webpage using Flask (iotdesignpro.com)	• Raspberry Pi • Servo motor
8	Raspberry Pi Amateur Radio Digital Clock	Raspberry Pi Amateur Radio Digital Clock : 8 Steps (with Pictures) - Instructables	• Raspberry Pi • 4-digit LED display
9	Smart Alarm Clock with a Raspberry Pi	Make a Smart Alarm Clock With a Raspberry Pi - Howchoo	• Raspberry Pi • LCD display • **Speaker**
10	Displaying Time using Raspberry Pi	Raspberry Pi Digital Clock by Interfacing a 4-digit 7 Segment Display (circuitdigest.com)	• Raspberry Pi • 4-digit LED display
11	Raspberry Pi Parking Sensor with Ultrasonic Sensor and LED	Raspberry PI Parking Sensor with HC-SR04 and LED Bar (peppe8o.com)	• Raspberry Pi • **LEDs x 10** • Ultrasonic Sensor
12	Compass Maze	Compass Maze - Introduction | Raspberry Pi Projects	• Raspberry Pi • SenseHAT
13	Weather Logger	Weather Logger - Introduction | Raspberry Pi Projects	• Raspberry Pi • SenseHAT
14	Machine Vision Using Python	Cats vs dogs - Introduction | Raspberry Pi Projects	• Raspberry Pi • **Pi Camera**

B) Arduino-Based Projects

Project No.	Title	Reference	Hardware Needed
1	SPI communications	https://circuitdigest.com/microcontroller-projects/arduino-spi-communication-tutorial	• **Arduino** (2) • LED (2) • **Push Button (2)** • **Resistor 10k (2)** • **Resistor 2.2k (2)**
2	Control Computer using Hand Gesture	https://circuitdigest.com/microcontroller-projects/control-your-computer-with-hand-gestures	• Arduino (1) • Ultrasonic Sensors (2)
3	Creating Graphic	https://circuitdigest.com/microcontroller-projects/interfacing-arduino-with-vpython-creating-graphics	• Arduino (1) • Ultrasonic Sensor (1)
4	Sun Tracking Solar Panel	https://circuitdigest.com/microcontroller-projects/arduino-solar-panel-tracker	• Servo Motor • Arduino • **Photoresistor (2)** • **Resistor 10k (2)** • **Battery (9V with adapter)**
5	Arduino 7 Segment Display Clock Without RTC	https://electronics-project-hub.com/arduino-7-segment-display-clock-with-and-without-rtc/	• Arduino • **Push buttons (2)** • LED (2) • **Resistor 120-ohm (4)** • **Resistor 330-ohm (1)**
6	Connect Arduino to IFTTT	https://www.learnrobotics.org/blog/connect-arduino-to-ifttt-for-iot-projects/	• Arduino • **Potentiometer** (1)
7	Ultrasonic Ranging Using Arduino	Ultrasonic Ranging Using Arduino and Processing (Radar) - Arduino Project Hub	• Arduino • Ultrasonic Sensor • Servo motor

C) Raspberry-Arduino-Based Projects

Project No.	Title	Reference	Hardware Needed
1	Weather Station with Arduino, Blynk and Raspberry Pi	Weather Station with Arduino, Blynk and Raspberry PI OS Lite on Raspberry PI Zero W (peppe8o.com)	• Raspberry Pi • Arduino • **DHT11 Temperature and humidity sensor**
2	Communication between Raspberry Pi and Arduino with I2C	Communication between Raspberry Pi and Arduino with I2C • AranaCorp	• Raspberry Pi • **Arduino** (2)
3	Raspberry Pi (master) Arduino Uno (slave) SPI communication	Raspberry Pi (master) Arduino Uno (slave) SPI communication with WiringPi - The Robotics Back-End (roboticsbackend.com)	• Raspberry Pi • **Arduino** (2)
4	Arduino Data Logger (CSV) with Sensors and Python	Arduino Data Logger (CSV) with Sensors and Python - Learn Robotics	• Arduino • **Potentiometer** • **Photoresistor** • Raspberry Pi