Lab – Design a Prototype of an AI Application

Objectives

Part 1: Consider an IoT Application with AI/ML Technology

Part 2: Design Components Required for an IoT Application with AI/ML Technology

Part 3: Describe the Process and Operation for the IoT Application with Flowcharts

Background / Scenario

With IoT devices and IoT networks getting popular, technologies for IoT devices are also improving rapidly. IoT devices are no longer limited to sensors and actuators; they may have the capability to think and act accordingly according to environment changes, thanks to the development of artificial intelligence (AI) and machine learning (ML). This lab is designed as a group project. The ideal group size is 3 to 4 people.

Required Resources

Device with internet access

Part 1: Consider an IoT Application with AI/ML Technology

In Part 1, the group members will list the functions and features of a smart home thermostat and controller device with capability of self-learning, making decision based on the environment changes, and acting accordingly.

Step 1: List the desired features and function for such a device.

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Step 2: List the factors that may influence the perception of temperature.

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Step 3: List the ways the smart device can get information about those factors.

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Part 2: Design components required for the device with AI/ML Technology

In Part 2, the group will explore and design the functions of the key components required for the smart thermostat/controller.

Step 1: What are the key components for a smart thermostat/controller?

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Step 2: List the process and operation of the smart thermostat/controller?

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Part 3: Describe the Process and Operation for the IoT Application with a Flowchart

In Part 3, the group will use flowcharts to describe the logic flow for data collection, data analysis, human being interaction, and taking proper actions.

Step 1: Using a flowchart, describe how data is collected, communicated to the AI/ML application in the cloud computing, and processed.

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Step 2: Using a flowchart to illustrate the general operation of the smart thermostat/controller

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Reflection

1. Which component provides the brain power for the learning and then adjusting accordingly?

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2. Can you think of other IoT devices that will learn over time and improve their operations?

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