Department of Electronic and
Telecommunication Engineering
UNIVERSITY OF MORATUWA, SRI LANKA

This is to certify that

Uvindu Kodikara

has participated in the 60-hour training programme on

Artificial Intelligence in Embedded Systems

conducted by the Department of Electronic & Telecommunication Engineering,

University of Moratuwa, Sri Lanka

Course Coordinator

For online verification

18th October 2024

Head
Dept. of Electronic &
Telecommunication Engineering

Training Programme Outline

This training programme is on deploying machine learning workloads on edge devices. The training covered:

- Introduction to machine learning with hands-on examples
  - Get an intuitive understanding of machine learning with hands-on examples using Google Colab, PyTorch, TensorFlow, and TensorFlow playground
- Building and training deep learning models
  - Learn how a deep learning training pipeline in the cloud will work with real-world examples and code them on your own with Google Colab notebooks.
- Programming in embedded systems and In-depth
  - Make the shift from Python to C++ while learning about embedded hardware and software that can facilitate deploying machine learning at the edge using TinyML on Arduino and Cube.AI on STM32.
- Machine learning pipeline at the edge with Edge Impulse
  - Learn how to develop your own end-to-end machine learning pipeline at the edge with Edge Impulse + Arduino Nano 33 BLE Sense and its multitude of sensing capabilities.
- Training, validating, and deploying
  - Step-by-step process to train, validate, deploy, and test two real-world embedded machine learning applications using the Arduino Nano 33 BLE Sense.

Dates: 24th June 2024 to 2nd September 2024

Venue: Online

Assignments: Completion of at least 3 out of 4 of the below assignments:

- Detect hand gestures using a convolutional neural network (CNN).
  - Using Google Colab notebooks.
  - Build a computer vision model to detect hand gestures.
  - Focus on 3 gestures: rock, paper, scissors.
- Build and train nanoGPT model.
  - Using Google Colab notebooks.
  - Learn about a simple Generative AI model that you can build and train from scratch..
- Using Nano33 BLE Sense for motion detection.
  - Using Edge Impulse platform.
  - Create a motion detection model for MCUs that can identify a range of motions by a potential client.
  - Train using data from the onboard IMU (Inertial Measurement Unit).
- Implementing TinyML HelloWorld on an Arduino Uno.
  - Using online simulator platform Wokwi.
  - Implementing a simple machine learning model on the Arduino Uno v3.