**Description of development to be undertaken including tools to be used (300 words):**

The hardware used in this project will be an Arduino based micro-controller, such as the Arduino Nano 33 BLE Sensor development kit, along with some type of peripheral devices, for example an ultrasonic sensor, or potentially a microwave sensor, which will be used for data capture. Depending on how the system is set up, there may be a need for some external memory, such as an SD card for data storage – if needed, this extra storage would only be needed in the data collect phase of the project. The code used on the Arduino will be developed in the standard Arduino IDE. Other hardware will be the obstacles. Examples of obstacles could be flowerpots of various sizes, steps or ladders, a chair outside an office or hallway table, and so on.

When the data is ready to be processed. Several models from both the Deep Learning and Machine Learning approaches will be selected and implemented using the data, in TensorFlow. At the end of this process, the best preforming model will be selected, and this will be optimised in TensorFlow Lite. It should be noted that if the results for several models show similar performance, there may be a case to optimise each in TensorFlow Lite. For further evaluation.

Once the model (or models) has been optimised, they will be deployed to the Arduino using the Arduino IDE, with the performance evaluated against a number of metrics. The evaluation metrics could be factors such as correct decision making, latency, memory usage, power consumption and so on.