

# A Framework for Sensor Monitoring and Theft Detection

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<b>Prerequisites:</b>	- Good knowledge of Machine learning, Python and embedded programming
<b>Level:</b>	- This topic is appropriate for Master Students
<b>Language:</b>	- English

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## INTRODUCTION

This proposal aims to present a project centred around developing a sensor node capable of detecting movements or suspicious actions and triggering alerts using machine learning techniques. The proposed sensor node will serve as an IoT device applicable in various contexts where its reliable operation and timely notifications are crucial. The sensor node can identify suspicious actions and initiate appropriate responses by leveraging machine learning algorithms.

## PROJECT DESCRIPTION

The following tasks need to be executed:

- Step 1: Listing possible suspicion actions:
  - In this step, try to list several suspicious behaviours which cause the unreliable operation of IoT-based environmental monitoring system which are deployed in outside environments. The example of sensors that can be utilized is: Temperature, Humidity, Co2, camera
- Step 2: Design the complete system with all hardware and software components required.
  - Make a list of the required hardware for detecting suspicious behaviour (e.g. Accelerometer, An ultrasonic sensor), make sure it is compatible with each other and complete.
- Step 3: Implement the basic system for recording and storing data for several days
  - In this step, we want to gather a dataset from normal behaviour and suspicion attempts (ranging from only small attempts to remove/relocate the node to successful removal/misplacing). Record the ground truth of these events.
- Step 4: Analyze the data with multiple ML algorithms to recognize a malicious event.
- Step 5: Implement the model on the sensor nodes and the alarms. Then, test the implementation and record the malicious test events and how the system reacted.
- Step 5: Document all steps and their results.

## CONTACT

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