# Project Scope

## Project Statement

The aim of this project is to create a web application system to keep track of the exact number of intruders within a specific area using predefined sensor pattern and having the ability to access this system over the internet via cloud technologies.

## Key Technologies

### Google Firebase – Cloud based database

This is a cloud platform where the data is stored securely on google database. System administrator can select which country to store this data and restrict access of the database against intruders which is important.

### Beaglebone – IoT kit web server

This is the IoT hardware used to handle all the computation of the intruder detection. It takes the sensor reading and compute it and send the following data to firebase and store it there. It is also possible to store a local database for local use and backup purposes.

### Node.js – Programing Language

Node.js is a JavaScript programming language used for this project and it is used to program the computation of the intruder counter and relaying messages between Firebase and BeagleBone.

### HTML and CSS – The building blocks of webpages

HTML stands for hypertext markup language which allows the creation of web pages and web application but in a very basic form. These said webpage are then enhance visually from the help of CSS which stands for cascading style sheets.

### SSH – Secure Shell

This is a network protocol used to control the server remotely. This is mainly used because the BeagleBone hardware does not include a display and controller. So as system administrators we must remotely access the BeagleBone locally using USB port or over the internet via SSH from a laptop or desktop.

## Key Functionality

First, the system must be able to be access anywhere where internet is assessable. It must be able to record the total number of long motion and short motion and store this information in Firebase. These said long and short motion will be compute by BeagleBone to determine the accurate number of intruders within the area of operation. All these data will be shown to the users through a webpage in HTML design using CSS. Besides that, the users must be able to reset the database, turn the LED on or off and sensor on or off from the server.

## System Constraint

The system server will not be able to handle large number of users due to hardware limitations because it is using a IoT grade processor. False positive sensor reading might also occur from the sensor that could disrupt the system performance and accuracy.

## How the system works



1. Sensor sends a stream of reading to BeagleBone server
2. BeagleBone compute the data and send it to a network interface or switch
3. Data will be stored on firebase and could be stored locally for local access and backup purpose
4. Users than access a webpage created to view the data from Google Firebase via the internet.