# Programming Things group Specification

## Introduction

For our group project we have decided to create a zumo and Arduino based project that uses different sensors to detects hazards in a room. For the detectors we have decided to use a Geiger counter to measure the amount of radiation, a heat sensor to detect the temperature of the room and a light detector to measure the brightness in the room. We will also connect a camera to the rig that will send a feed back to the control computer to be able to see what’s going on in the room.

## Objective Aims

* Should be able to control Zumo wirelessly using the XBee modules
* Create a GUI to show the data being received and camera feed
* Should be able to connect a camera wirelessly to show feed on the GUI
* Use a Heat sensor, Light sensor, and Geiger counter to measure the temperature, brightness, and amount of radiation in a room
* Connect the sensors to an Arduino MKR board so the data can be collected
* Use a web socket to send the data from the Arduino over to the control computer to then show on the GUI
* Show the current reading of all sensors on the GUI and the maximum heat and Geiger counter readings and make the GUI reflect safety levels of the room

## Constraints

One constraint of this project is acquiring a couple of the devices needed to complete the objectives like a Geiger counter to use with the Arduino as well as an Arduino camera, as the university doesn’t have any Geiger counters and doesn’t have a camera that we can use, we will have to buy these online. Another constraint is finding a way to put it all together and as one system. As it is a few devices working together, we’ll need to create a rig to store it all that the Zumo can move about.

## Functional Requirements

* The Zumo needs to be controlled manually by a computer using ‘WASD’
* The Controls need to be sent over Serial using XBee modules
* The different sensors need to be able to collect data for the Arduino to send to the computer
* The Arduino MKR needs to send the sensors data over the Internet to the computer
* The camera needs to be able to send it’s feed wirelessly to the computer
* The GUI needs to be able to show the camera feed and the data being sent over from the sensors and Arduino