# Sensor Testing Rig

Introduction

Testing without simulating environment can be challenging, especially when testing sensors, this usually needs a hardware and software working together to simulate the test case. Your task is to create a test rig for that. These sensors can vary from different types, usually they are motion (occupancy) and people counting sensors. Some of them can have an ambient light sensor and temperature measurements.

The fundamental sensing technology can change, but the technologies we are trying to test is, FIR (far infrared ray) cameras, radars, PIR. All of these have different sensing mythology (they sense different variables) as an example FIR sense the heat emission of a body, while radar sense the motion within certain areas. Its also worth mentioning that these sensors have different field of views when installed.

1. Tested sensor.
2. Moving/Heated/Light emmiting objects
3. Matrix of objects
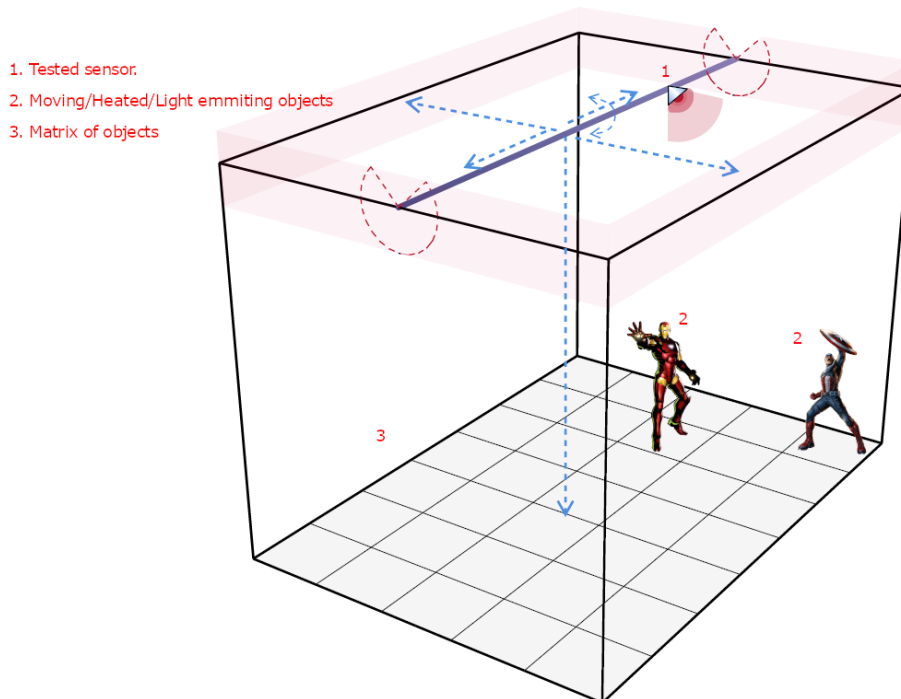
Picture 1 Example

Your task is to build a multiple use test rig that has multiple sub elements. The base of the testing rig should have a matrix of objects that can move even slightly (maybe vibrate). These objects should also be heated (or have the capability to increase heat). As a plus would be if these objects get heated with a built-in light source (LED), this way they can also be used to test the other side sensors built in within the sensing component (temperature and ambient light sensor).

These objects within the matrix needs to be controlled either individually or row/column control (combination of both is a huge plus). The matrix should contain a minimum of 25 moving objects (the one described above) and a maximum of 300. These objects can be moved using motors (servo, vibration motors, stepper motors etc.)

The sensor component-mounting rig on top of the base should have a freedom of 3d movements. Meaning that the mounted (the sensor components to be tested) can move up and down left and right also forward and backward (all 3 axes), the mount itself should be able to rotate to change the field of view of the sensor.

You are allowed to come up with your designed and implementation, this task will need software, hardware and mechanical skills, probably there will be a necessity to 3d print as well (so a designer is needed too) please check the picture bellow for a very brief illustration.

You will have to use an SBC (single board computer) like Raspberry Pi or Arduino or even better one to control the whole test rig. There should be also an interface to command or automate the test (this is a plus).

Enquiries and information

Abdulla Ibrahim Email: Abdulla.ibrahim@helvar.com