

INTRODUCTION

The Internet of Things is dawning upon us, every day more and more household items are being connected to the internet. The introduction of smart homes/buildings is being incorporated a lot more into everyday life, the system that I propose to build will be similar to what others have created, however it will focus more on the involvement of wireless sensors and also look at and evaluate the network's performance.



Figure 1 [1]

OBJECTIVES

Practical Element;

- Design and implement a working WSN in the Cisco Lab.
- Configure a Raspberry Pi to be the management device of the WSN.
- Configure the WSN to adjust the rooms temperature automatically if it gets too hot/cold.
- Configure the WSN to automatically control lights.

Simulated Element;

- Create a simulation of the WSN which mirrors the design of the practical implementation.
- Simulate in Matlab's Simulink, the various modulation techniques that can be used in the WSN.

AIM OF THE PROJECT

The practical element of this project is to create and implement a fully operational Wireless Sensor Network (WSN). The WSN will control the lights and temperature of the Cisco laboratory, to adjust accordingly to the environment of the room. The second task of this project will be to simulate the WSN in appropriate simulation software. The results will be compared and contrasted, so that a true performance evaluation of the WSN can be obtained from these experiments.

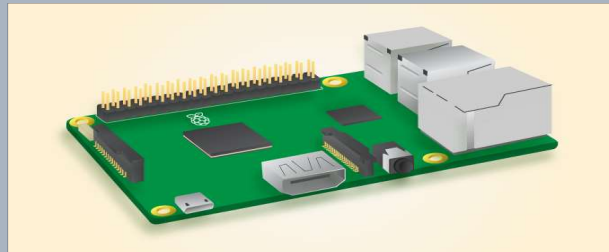


Figure 2 [2]

HOW ITS GOING TO WORK

Installing the Sensors;

Install Proximity sensors on to the chairs in the Cisco Lab; this is so when a person sits on the chair the light above will turn on.

Install two, "Resistance Temperature Detectors"[3]. The first temperature sensor will be installed above the network stack to record temperature information for that specific area. The second sensor will be installed in the centre of the room, so that it can work inline with the rooms heating system to adjust the temperature accordingly.

RELATED FIGURES

U.S. Leads the Way in Smart Home Adoption

Estimated number of smart homes (in million households)

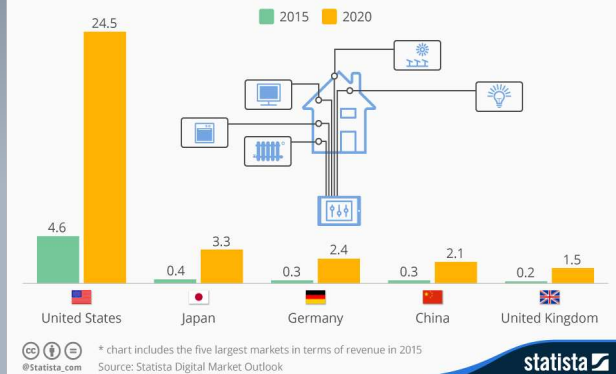


Figure 3 [4]

Scan the QR code's below to see what smart home technologies are emerging.



REFERENCES

- [1] MakeurMove, "How secure is a smart home," 2010. [Online]. Available: https://www.makeurmove.co.uk/article/1456/How_secure_is_a_smart_home. [Accessed: 05-Oct-2016].
- [2] Raspberry Pi, "Raspberry Pi 3 Model B - Raspberry Pi," 2016. [Online]. Available: <https://www.raspberrypi.org/products/raspberry-pi-3-model-b/>. [Accessed: 05-Oct-2016].
- [3] D. Corporation, "RTD , Resistance Temperature Detector," *Current*, pp. 3–5, 1800.
- [4] Felix Richer, "Chart: U.S. Leads the Way in Smart Home Adoption | Statista," 2015. [Online]. Available: <https://www.statista.com/chart/3919/smart-home-adoption/>. [Accessed: 05-Oct-2016].