

Investigation and Implementation of Uses for the Physical Web on a University Campus

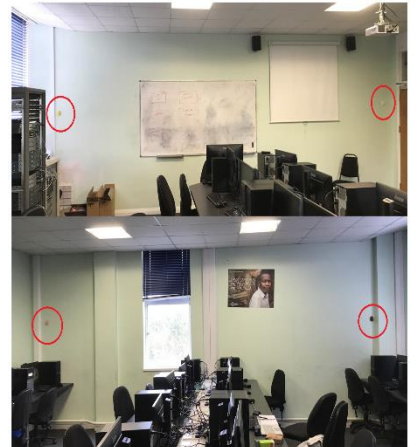
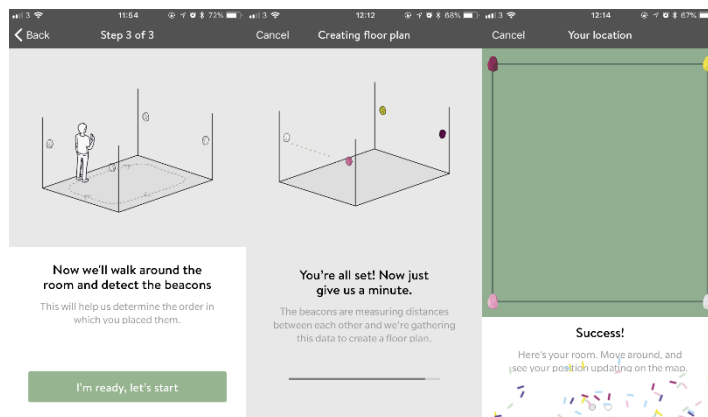
Liam J Ridley – BSc Computer Networks and Cybersecurity – liam.j.ridley@gmail.com

1. Introduction

The aim of this project was to investigate and implement different uses for the physical web on a university campus, and to conclude whether the systems should be implemented on a larger scale. The Physical web uses Bluetooth Low-Energy (BLE) beacons to broadcast URLs which complete different tasks or provide information [1]. Within the report is a literature review, this looked at how the physical web can be used, finding two uses for this project; indoor location-mapping, and broadcasting location-based information. The review also looked at the hardware that will be used, finding; Estimote UWB location beacons, and the Eddystone beacon protocol. The review also covered software and security.

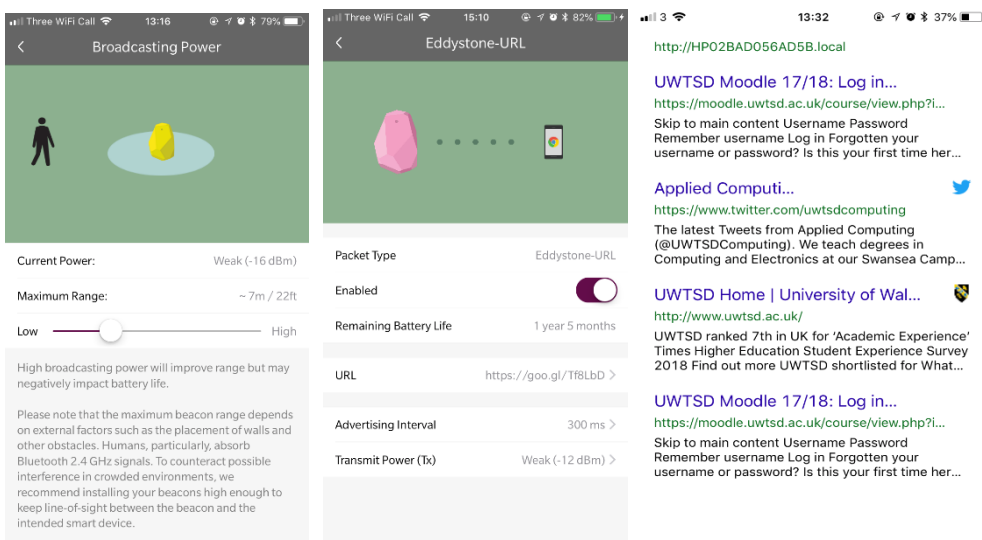
2. Location-Mapping

The location-mapping system was implemented in two scenarios, a Hallway and a Classroom. The system used Estimote UWB location beacons to map the layout of the room. One beacon was placed in each corner of the room, the user then walked around the room from beacon to beacon to allow the beacons to communicate with each other and automatically map the size and layout of the room. Below are some of the configuration steps, and the positioning of the beacons within the classroom.



3. Location-based information

The Location-Based information concept was implemented in four separate scenarios; a classroom, hallway, 3rd floor of a building, and a reception. The beacons broadcasted URLs leading to different websites such as the university website, twitter, etc. For each beacon you can configure; what URLs are broadcasted and to what distance. The implementations were tested on an IOS and Android device.



4. Results

The mapping system in the classroom and hallway did not perform as expected, positioning on the map was delayed, making it inaccurate. The location-based system worked fully when tested on an IOS mobile device, the IOS device received all of the broadcasted URLs. However the android mobile device only picked up half of the URLs being broadcasted.

5. Conclusion

Overall, the aim of the project was met, however, based on the results produced, the mapping system should not be implemented on a larger scale using these particular beacons. The location-based system, however, should be implemented further, as results show that it does work, but due to the Android device used in this project, the results were negative.