PROJECT 10 – ORANGE LABS SENSORS API

Group Members
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Overview

As of 17th November, a second meeting with the client to finalise the formal requirements and direction of the project has occurred. Tasked with a low-level infrastructure project, it was decided to first look at it from a high-level approach by considering potential applications that would depend on said infrastructure. Thus, further research into hardware, protocols and existing systems - with a significant focus on current sensor applications and potential usecases of a sensor network has been carried out.

Summary of progress so far

- Had another meeting with the supervisor on the 28th October to discuss two potential ways of implementing a network for a 'Protocols & Plug-and-Play' project. This meeting also covered project concerns.
- Researched into current up-to-date applications of sensors in and around London and its underground.
- Carried out research into existing/ on-going 'Smart City' projects that aggregate data from sensors around cities, analyse them, and aim to fix inefficiencies found.
- Hardware such as Bluetooth 4 and Zigbee were also looked into in addition to sensors in general.
- Held a team meeting on 9th November to discuss the research above, gain insights from other team members and brainstorm potential use-cases
- Contacted the client and set a date for a secondary meeting to discuss research/ use-cases
- Pre-client prep meeting on 16th November
- Had the second meeting with the client on 17th November to find out expectations, interests and requirements given use-cases provided.

Summary of meetings

Tuesday 28th October – Current progress and Q&A Project Concerns [**Supervisor Meeting]**
Location: 6th floor MPEB
Time: 2.30pm – 3.30pm
Attendees/Absentees: Johan, Gulliver, Vino, Victoria, Leslie, Georgi / None

The two methods we had thought up of to set up a network of sensors were brought up. The majority of the rest of this meeting consisted of a Q&A on project concerns. Some concerns addressed include questions on what our client expected from us (deliverables), how this project was different from other very similar projects out there looking into smart cities by collecting data from a sensor network and using this to fix inefficiencies, the potential high-level aims for the system and general course deadlines.

Sunday 9th November – Existing sensor applications & potential use cases **[Team Meeting]**
Location: Skype Conference
Time: 8.00pm - 9.30pm
Attendees/Absentees: Johan, Gulliver, Victoria / None

As a preface to this meeting, sensors in the London underground, recent smart city projects carried out at places such as MIT, IBM and sensor applications / projects being implemented in and around London at present were discussed.

Some recent sensor applications discussed include: CycleEYE (preventing bus-pedestrian collisions), AirSensa (setting up a network of air-quality sensors to detect and collect useful information about pollution), LED street lamps set up in Birmingham which are sensor controlled over the more traditional sodium bulbs, parkRight (existing app rolled out by Westminster to help people efficiently find a place to park) amongst other pieces of miscellaneous information like a start up's 'nearables' found.

Subsequently, sensor network usecases were discussed. These include:

- Pollution - (and applications of an extension into pollen sensing)
- Illegal parking & traffic wardens (and applications of a parkRight extension)
- Optimisation of rubbish collection (sensors on bins)
- Road conditions - ice/ water / potholes (using vehicles)
- Bus live-tracking - (found to have a few different apps in existence already)

Less viable usecases were also brought up such as:

- Rodent population tracking via sensors
- Accurate weather checking via placing sensors on street lights
- Affecting the brightness of street lights via sensors (i.e. a less bright road when no one is walking past/ no cars driving by)
- Flooding control

To wrap up the meeting, brief discussion on setting up a web server, the proof of concept document on Moodle and general concerns regarding the lack of client response was brought up.

Sunday 16th November – Pre-client meeting prep **[Team Meeting]**
Location: Skype Conference
Time: 9.15pm - 10.50pm
Attendees/Absentees: Johan, Gulliver, Victoria / None

Updates into research made and any new thoughts regarding the usecases discussed last meeting were brought up first. This was followed by a general conversation on the order of information to be presented to the client tomorrow along with any outstanding issues and concerns that we required them to address.

Monday 17th November - Conference call with Orange Labs **[Client Meeting]**
Location: Conference call
Time: 5:30pm - 6:15pm
Attendees: Victoria, Johan, Gulliver, Leslie - [from Orange] Mobeen, Ben, Kashif

The primary aim of this meeting was to outline goals and deadlines expected of this project and hear the clients' thoughts on the current direction taken into research in order to derive a set of requirements the team would have to meet.

This meeting began with an explanation on the initial research carried out around the four sub-topics identified in the initial meeting and the decision made on which to pursue. Potential usecases the project could be directed in were then pitched – eventually resulting in an agreement to focus on a parking sensor infrastructure.

The possibility of Orange supplying hardware for prototyping purposes was then brought up. It was agreed that prototyping would be carried out through arduinos or raspberry pis, potentially to be provided by Orange as needed.

Lastly, the scope of the project and potential limitations imposed due to time constraints was discussed and first- and second-term goals were outlined by the client.

Next Report Actions

GULLIVER

Since the last report I carried out further undirected research into existing platforms and technologies that serve a similar purpose. From these I could build a more substantial resource of tried-and-tested implementation approaches, and gain an insight into issues we might potentially face in our own efforts.

Now that our research can be more targeted as we enter the development phase, I plan to carry out case studies and analyse real-world scenarios to support the design of how we could implement our system in our use case. I also hope to make progress on the documentation - namely establishing the project website, developing the system design report, and assisting with formalising the research that has already been conducted in a digestible way.

VICTORIA

In the past weeks, I have looked into recent applications of sensors around London, existing apps that make use of sensor data and scheduled a few meetings with the team.

For the next two weeks I will be focusing on first helping to identify requirements properly for this project, setting up a meeting for the team to discuss and properly plan out the project direction through the creation of a Gantt Chart and then move on to looking into limitations of the parkRight app which makes use of a network system of 3,000 sensors around Westminster, how we as a team can perhaps build on this or around areas not yet touched by this existing parking system and proceed from there.

JOHAN

These past three weeks, I have done research, specifically looking at possible use cases and how to implement them. I looked at ways in which we could connect sensors together in a network, using bluetooth and wifi. I then had a look at what specific sensor readings we could get and how they could be of use to us.

Over the next two weeks, I plan to work on improving my java skills, specifically looking into Bluetooth/wifi and how to construct the back-end of a system. I also plan to work on the 15 min video presentation and parts of the website where needed.