

Dissertation Proposal

Luke Morgan

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1 Summary

To develop a prototype electronic security system that utilises RFID technology, allowing for tracking of users throughout the system, fine grained control of user access, and extensive reporting capabilities.

1.1 Terms

User - An RFID card carrying user of the system, in a real world environment this would equate to an employee

Swipe - The act of a user swiping their RFID card in front of a sensor

2 General Description

Building on knowledge acquired whilst undertaking my undergraduate dissertation [1], I seek to develop a prototype hardware system based around the Arduino platform [2] and RFID technology [3] that provides an electronic security system for a hypothetical building.

This hardware system will deal with physically detecting a 'swipe', and then pass the collected information taken from the users RFID card on to the software system.

The software system will consist of three components: an API that handles receiving, parsing and the processing of swipe events; a back-end system (Core System herein) that manages users, privileges, and logs; and a front-end system that provides the system operator with a web based interface for the system.

2.1 The API

The Java API that will be developed as part of this project will be responsible for processing information received from the hardware system, and will deal with error-checking and parsing of the raw data.

By developing an API it will enable the hardware system to potentially be used in a variety of different scenarios: clocking in systems, security systems, fire register systems etc.

2.2 Core System

The core software system will be responsible for three things:

- Processing and storing the sterilised data provided by the API;
- Triggering appropriate events upon receiving data (e.g. granting access to an area);
- Managing users and user privileges.

It will then provide methods and interfaces that allow the front-end system to interact with it.

2.3 User Interface

One of the primary focuses of this system will be upon its monitoring and reporting capabilities. The web-based user interface will give the system operator a real-time overview of which users are ‘logged in’, which areas they’re occupying, what time they entered the building etc.

Detailed reports will also be made available via the web interface so the operator can search for who was in a given area at a given time, what time a person left on a given day etc.

Whilst not finalised, the aim is to develop the user interface using the Vaadin UI framework [4].

3 Concluding Remarks

The originality aspect of the dissertation will be covered by the development of the API, which will be released on an Open Source license and allow other developers to implement it in their own solutions.

If you’re interested in supervising this project, please get in touch. Similarly, if you know anybody else who may be interested, I would greatly appreciate you forwarding

this proposal on to them.

Luke Morgan

lcmorgan@liverpool.ac.uk

<http://nothingbutreboots.com>

[1] <http://projectzed.org>

[2] <http://www.arduino.cc>

[3] <http://www.sparkfun.com/products/10074>

[4] <http://vaadin.com/home>