



EC500 J1 Project Proposal

Smart Car Entry

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Introduction

Nowadays, the electronics devices got a tremendous development, and internet is also much easier to access than ever, thus, I always think about to let my smartphone to control everything, such as my car, my home front door, etc.. However, the intellectualization of cars are much slower than smartphones, and it is so difficult to use, so I decide to choose the “Smart Car Entry” as the topic of this project.

This project is about to use a smartphone to unlock a car door. In order to achieving this goal, I choose to use an iOS App as my operation tool, Amazon Web Service as the data relay, and FRDM-K64 Board as the controller, and a LED represents the car door, when it on, means the car door is unlocked

The Technologies that this course covered are,

- Authentication by using fingerprint and voice recognition
- Connectivity by using Ethernet, 802.11, TCP/IP
- APIs by using Apple Touch ID, Amazon Web Service
- IoT
- FRDM-K64 Board

Resources

Hardware: An iPhone 7 plus, a FRDM-K64 Board, an ethernet cable, two LEDs(red and green)

Software and Service: Xcode as the IDE for developing the iOS App, Amazon Web Service for transferring data between iOS App and FRDM-K64 board.

Technical Risk Areas & Risk Management

The major technology risks I faced are iOS App development, Touch ID, Voice recognition, iOS App communicate with the Amazon Web Service and the Amazon Web Service communicate with the FRDM-K64 board.

To control these risks, I think first of all the most difficult part is the voice recognition, to avoid potential failure to this project, I put the voice recognition as optional, because it is not a necessary component, so I will try to add this feature on the iOS App, but if it is too hard, I will just abandon it. For the rest of these risks, such as Touch ID, I think there are some mature SDKs I can use, so they should not be very big problems.

Technical Approach (40)

2 - 3 pages

Outline the technical approach from beginning to the completion of the project (an 8 week runway). Describe how you intend to modularize your project and explain your thought process and approach, detailing specific tasks and the order in which they need to be completed.

For teams, also list each team member's exact responsibilities and contribution towards the project in separate sections.

Firstly, I will get the iOS App done, the iOS App is going to authentic the user's identity by using Apple's fingerprint technology, Touch ID, the most secure and handy way to verify one's identity, and also by using voice recognition as it's back up way for authentication. First three weeks I will finish the Touch ID part, and the fourth and Fifth week I will try to finish the Voice recognition

Secondly, I will focus on the Amazon Web Service. Once the iOS App has verified the user's identity, it will send a data to the Amazon Web Service and then Amazon Web Service will relay this data to a FRDM-K64 board though a ethernet cable by connecting to the board, then the board will be on a standby mode, waiting for further orders from the smartphone, and meanwhile the board will return a data about this standby condition to the smartphone though Amazon Web Service. Finish this is about take 1 week.

Finally, when user presses the button about "unlock car door" on the App, it will send another instruction that tell the FRDM-K64 board to unlock the car door through Amazon Web Service, the the FRDM-K64 board will unlock the door.

Milestones

- iOS APP Prototype — Done by April 10th
 - Finish the Project design

- Basic App, Password Part Works — March 27th
- Touch ID — April 3rd
- Voice Recognize — April 10th

- Google Cloud Service — Done by April 24th
 - Connect iOS APP to Amazon Web Service — April 17th
 - Connect Amazon Web Service to FRDM-K64 Board — April 24th

- Project Done — May 1st