Start Date – End Date:
September 11 - September 22

Group number:
sddec18-17

Project title:
IoT Remote Monitoring for Commercial Appliances

Clients:
Taylor Greiner
Connor Jennings

Advisor:
Goce Trajcevski

Weekly Summary
The goal of our second reporting period was to begin front-end backend integration. Front-end design requirements required both a rewrite of existing APIs and AWS lambda functions and the creation of new APIs and AWS lambda functions to store and retrieve user information. Previously, a user login API would return a boolean for success or failure. A better approach was to return a JSON of user attributes that can be cached on the device such as a userId. The user information is then used to retrieve other relevant information associated with the user such as historical and future reservations, settings, and payment method. Likewise, new APIs were written to retrieve a users' historical and future reservation data. Furthermore, a user must add a payment method in order to create a reservation. APIs were written to store credit card information and retrieve credit card information on checkout. The week marked a major milestone for front-end-back-end integration. The hardware team faced setbacks regarding the 3x4 matrix style keypad. During the last reporting period, it was mentioned that a failed soldering step led to a "broken" keypad. It was verified that the soldering step damaged the origin board and a metal attachment involved in the soldering step could not be recovered. A new keypad must be purchased to further the hardware implementation.

Past week accomplishments

Team Member 1 - Name
John Fleiner
Team Member 1 - Role
Android Development Lead
Team Member 1 Contribution
Android Front-End UI
- Updated loginActivity, RegistrationActivity, HomeActivity + fragments to match the updated UI.
- Implemented CardActivity: Screen for storing credit card information
- Implemented ReservationActivity: Screen for viewing a list of all user reservations
- Implemented CurrentReservationActivity: Screen for viewing a selected a selected reservation
- Added SlideUp Android Library for implementing navigation drawers.
- Implemented ProfileActivity: Navigation drawer for viewing reservations, history, payment information, help, and settings

Android Data Storage
- Implemented MVC Models for ATMs, Laundromats, and Banks

Android Threading
- Implemented API, handling, and callbacks for ATMs, Laundromats, and Banks

Data Collection
- Parsed / Queried openstreetmap open source database for list of Laundromats, ATMs, and Banks in Ames, IA.

Relational Database Schema Design
- Worked with Casey to create and update DB schema models for storing and retrieving new forms of data.

Team Member 1 - Hours Worked
16

Team Member 2 - Name
Ben Young
Team Member 2 - Role
iOS Development Lead
Team Member 2 Contribution
Further work on the iOS applications
- Added a library to the project to use a navigation drawer. The library is called MMDrawerController
- Had to do some restructuring so that the code was clean and readable after adding the navigation drawer library.
- The project is now easily expandable when I start implementing stripe and all the screens that going along with the user process of creating a reservation, adding a credit card, and/or looking at current/past reservations

Team Member 2 - Hours Worked
10

Team Member 3 - Name
Thomas Stackhouse
Team Member 3 - Role
AWS & Spring Boot Backend Lead
Team Member 3 Contribution
Working on implementing user authentication and replanning how some of the data is stored
- Got basic authentication method created, but when using the authentication token returned by logging in, it does not seem to be accepted. Need to debug this and figure out what is wrong
- Worked with John and Casey to figure out a better object breakdown for storing data

Team Member 3 - Hours Worked
6

Team Member 4- Name
Hongyi Bian
Team Member 4 - Role
Hardware Engineering Lead
Team Member 4 Contribution
Hardware further implementation
- Hardware components fixing
  - Tried to remove the solder failure from previous work
  - One of the seven pins failed from soldering, lead to a damage of the origin board. At the same time we require a new keypad, we try to remove the "failed solder" and recover the metal attachment. It turns out that the damage was not recoverable.
- Working on the design of integration of the final hardware set
  - The components are sitting on a piece of breadboard so far, we've been try to
  - figure a way to integrate those onto a more product-like set so that the final outcome are more professional like.
- Implementing Python scripts associating with keypad authentication
- Implementing Python scripts associating with LCD user interface
- Implementing Python scripts associating with communication function to AWS

Team Member 4 - Hours Worked
6

Team Member 5 - Name
Yuanbo Zheng
Team Member 5 - Role
Hardware Engineer
Team Member 5 Contribution
Further work with the implementation of hardware component
- Implement the Keypad & LCD Screen
  - Enable the user to type their reservation code through the keypad
  - Show up the number on the LCD screen as asterisk
  - Ask our client for new keypad since the last one has functional issue
- Further research and work with the hardware Security issue
  - Make sure our washing machine can only be unlocked during the reservation timeslot
  - Try to find a way to get some inner information (current & voltage) from the washing machine, just a try, may not use that.
- Work with hardware lead with the keypad authentication

Team Member 5 - Hours Worked
8

Team Member 6 - Name
Casey Gehling
Team Member 6 - Role
Spring Boot Backend Developer
Team Member 6 Contribution
- Implemented a couple reservation http requests for the front end
  - One returns all reservations with a date that is in the future for a customer ID
  - Other returns all reservations with a date that is in the past for a customer ID
- Implemented credit card http requests to store and query data for a customer ID
- Overhauled our database schema as necessary by the front end advancing
  - Created and populated a table with ATM machines around ames
    - Implemented a get and post query for the table
  - Updated 'location' table to be laundromat and added longitude/latitude
    - Updated getters/setters for the laundromat table appropriately
  - Updated the customer table to add email and remove credit card info
  - Created and populated a table with bank data
    - Implemented getters and setters as necessary
  - Created and populated a table with credit card data

Team Member 6 - Hours Worked
15

Individual contributions

Team Member	Contribution (Quick list of contributions. This should be short).	Hours this reporting period	HOURS cumulative (this semester)
John Fleiner	- Updated Android UI to match the newest UI wireframes - Implemented New Screens for Payment, Reservations, and Profile - Added AsyncTasks for retrieving Map data - DB Schema Model improvements	16	36
Ben Young	- Added navigation drawer library - Cleaned up code readability - Code is now easily expandable for work that is coming in the coming weeks	10	20
Thomas Stackhouse	- Worked on implementing basic user authentication - Did design planning with John	6	18
Hongyi Bian	Hardware components implementation	6	20

	● User end to AWS scripts implementation on Raspberry Pi		
Yuanbo Zheng	● Implement the Keypad & LCD Screen ● Further research and work with the hardware Security issue ● Work with hardware lead with the keypad authentication	8	22
Casey Gehling	● Implemented front end requests ● Reworked data model to adhere to front end design decisions	15	29

Pending issues

It was mentioned during the previous reporting period that our 3x4 phone-style matrix keypad was not fully working. The middle row of buttons were not responding, likely due to an incorrect soldering step. Our hardware engineers tried to recover a metal attachment involved with the soldering step, but verified that damage was caused to the origin board and the attachment was unrecoverable. Thus, a new keypad is required. The issue was reported to our clients who have helped with the purchasing of equipment and hardware components. Due to a delay in ordering the part, little progress has been made regarding the keypad failure. We must obtain the keypad as soon as possible to prevent integration delays between our backend team and hardware team.

Plans for the upcoming weeks

Team Member 1 - Name
John Fleiner
Team Member 1 - Role
Android Development Lead
Team Member 1 Plans
Primary Log:
- Update Login Api to handle new data response
- Write APIs for retrieving and populating historical and future reservation data
- Write APis for storing and retrieving credit card information
- Write APIs for submitting a new reservation
- Implement Models for handling the data and updating the UI views

BackLog:
- Tokenize payments in Android via Stripe
- Research Stripe Backend tokenization and report information to the Backend Team for Stripe Front-End ← → Back-end integration

Team Member 2 - Name
Ben Young
Team Member 2 - Role
iOS Development Lead
Team Member 2 Plans
- Functionality was added to apis that need to be implemented on my side
- Continue implementing the remains screens that were designed in inVision such as Reservation screen, add credit card screen, previous/current reservation information screen, etc

Team Member 3 - Name
Thomas Stackhouse
Team Member 3 - Role
AWS & Spring Boot Backend Lead
Team Member 3 Plans
- Finish debugging and roll out Spring Security
- Start working on AWS deployment via terraform

Team Member 4 - Name
Casey Gehling
Team Member 4 - Role
AWS & Spring Boot Backend Lead
Team Member 4 Plans
- Integrate the hardware controller with the backend to be able to communicate from the mobile app to the washing machine
- Try to get the remote database connection working with spring boot again

Team Member 5 - Name
Yuanbo Zheng
Team Member 5 - Role
Hardware Engineer
Team Member 5 Plans
- Get the new keypad and get done with keypad & LCD screen part
- Work with hardware lead to implement the integration of the hardware set
- Building connection between hardware with our backend side

Team Member 6 - Name
Hongyi Bian
Team Member 6 - Role
Hardware Engineering Lead
Team Member 6 Plans
- Start implementing the integration of the hardware set
- Working on building a connection with the backend
- Finish implementation of user interface

Summary of Bi-Weekly Advisor Meeting

The goal of our second Bi-Weekly advisor meeting with Goce Trajcevski was to discuss our upcoming in-class presentation. Our Senior Design 492 professor is highly knowledgeable within the security domain, so we must take take precautions and better identify both security and integrity constraints related to Iot Devices. Second, our meeting discussed the feedback that we received during the first in-class presentation. We were given constructive remarks for one of our project constraints: our clients ability to override machines. There may be problems with overriding machines. For example, reimbursements may be involved if a users machine is overriden. There may also be ethical or legal issues. To compensate, it may be beneficial to put a policy in place for overriding machines - legal terms, rights of use.