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9-8-20

Worobec

CPSC 491|

Team HW1

Commented [MK1]: <https://github.com/GU-CPSC-2020-21-Seniors/cpsc-491-2-senior-project-facial-recognition-security-lock>

Commented [MK2R1]: For when we submit

1. 20+ Questions for Sponsor/DAB member:
 - a. What should we work on this week?
 - b. Who are we making this for?
 - c. What users do we see using this?
 - d. What companies could use this?
 - e. Who could we talk to that might use this product?
 - f. What should we want to demo at the end of the year?
 - g. When should we hope to have a working demo?
 - h. What tips do you have for completing this product in the most efficient way? Are there outside resources that may be helpful?
 - i. Until we start coding our project in October, what should we be doing as designers?
 - j. Are there specific features, you as a sponsor or DAB member, would like to see when the product is finished?
 - k. What are some ways we can make the product easier for consumer use?
 - l. Where should we currently be in the process of design and what are the next steps?
 - m. What features could we add in addition to the main purpose of our project?
 - n. Who will test our product through the production stages?
 - o. Is this a product you would use in your home?
 - p. When should we have the Smart Lock & Ring available to work on?
 - q. When/How do we get reimbursed for the cost of our product?
 - r. What phones should the app work for?
 - s. Where would you like to see this product in the future?
 - t. Do you have any ideas for the product name?
2. Top 5 Questions:
 - a. Are there specific features, you as a sponsor or DAB member, would like to see when the product is finished?
 - b. Who could we talk to that might use this product?
 - c. Until we start coding our project in October, what should we be doing as designers?
 - d. When should we hope to have a working demo?

- e. What tips do you have for completing this product in the most efficient way? Are there outside resources that may be helpful?

3. Research write-ups:

a. Kevin – Competitors and Existing Products:

- i. Nuki BioID – Almost exactly what we proposed. The person attempting to gain entry to a property takes “selfies” on their phone through an app that compares it to already created biometric data. If the data matches, then it communicates with the lock and grants the person access. Interestingly, there is no public rollout planned yet. It’s very cool to see that we came up with an idea for this project and it happens to be something that a large company is already investing their resources into. It seems to validate that the development decisions that we made with our proposal were the correct choices to make.
- ii. StoneLock – This is an interesting one. It looks like a mounted iPhone when it’s on the wall. It scans your face and compares it to data that’s already stored in its system. It does not, however, store pictures. It sites that as a security/privacy feature. Their database doesn’t keep a record of the photos of your face. It instead translates the original pictures into mathematical representation. The lock is also accessible using a QR code or card swipe as a facial recognition alternative.

These are two of the biggest competitors that I've found that seem to have a product similar to what we are supposed to create. It’s interesting to see the different approaches to the problem. The Nuki lock is very similar to our project and is very new, so new that it has no scheduled release date yet. It also follows our idea the closest with the idea of using an app to recognize your face and communicate with the smart lock. The StoneLock is a slight variation in that the wall mounted device is what recognizes your face and communicates with the lock. This allows them to avoid using an app to connect the phone to the lock wirelessly. Instead, they drop the third wheel and simply use the mounted device and the lock.

This research into similar products should be able to give us an idea of what tools/design to follow as well as a general feeling that this is a manageable senior design project.

b. Carter – Feasible Project Resources

Although we have an idea of what we want our project to look like, there are steps we need to take to ensure our product is feasible. This includes what software we need to use to create the product.

After some research, it seems that an IOS App will be optimal to develop a working product that our Users can easily navigate. The IOS App will be how we primarily communicate with the Ring Doorbell and the Smart Lock since research shows APIs can be Accessed through XCode (Apples IOS development App). This will be a great goal point as it is the essential task we are looking for before we worry about any facial recognition. In addition to this, XCode also can communicate with OpenCV (where all the facial recognition happens) per:

<https://medium.com/@jaskaranviridi/setting-up-opencv-and-c-development-environment-in-xcode-b6027728003>

Along with this, XCode also can store data (although we may ultimately choose to store it elsewhere) thus fulfilling the last necessary task we need. Essentially what I am getting at is that everything is possible through XCode to provide us with a working product which is brilliant! 😊

I will also place the OpenCV Tutorial here:

<https://www.pyimagesearch.com/2018/09/24/opencv-face-recognition/>

Another thing to note is XCode uses the language Swift while OpenCV uses Python and C++.

c. Shawn – Smart Lock:

While designing our project, our group found that we needed to locate a smart lock that would be capable of not only locking the door, but also unlocking the door using GET and POST requests. This can be done using the smart locks' API key. Below are 3 potential smart locks that have API capabilities with a small description of each products features.

- i. Austin Smart Lock – Easy installation and use (works with current lock), battery powered, ability to be controlled remotely, scheduled/personalized access, can integrate with nest or other smart home systems, auto-unlocks via geofence technology, API access only through partner programs or IFTTT.

<https://august.com/products/august-wifi-smart-lock>

Api guide: <https://github.com/ryanblock/august-connect>

<https://medium.com/@nolanbrown/august-lock-rest-apis-the-basics-7ec7f31e7874>

- ii. Nuki Smart Lock - Easy installation and use (works with current lock), battery powered, ability to be controlled remotely, personalized access, can integrate smart home systems, auto-unlocks via geofence technology, open API access.

<https://nuki.io/en/smart-lock/>

Api guide: <https://developer.nuki.io/c/apis/15>

<https://developer.nuki.io/t/bridge-http-api/26>

- iii. Salto KS Smart Lock – Difficult Installation (need to replace current lock), battery powered, ability to be controlled remotely, personalized access, open API access.

<https://saltoks.com/hardware#smart-locks>

d. Drew – Major Features

- i. Ring doorbell: Ring has been around since 2012 and was bought by Amazon in 2018. Ring offers a smart doorbell with a wide view camera, a microphone, a speaker, and a motion sensor. With the help of the included app, users can view a live feed of their front door and receive notifications when motion is sensed.
- ii. Smart lock: for the Facial Recognition Security Lock to work, there needs to be a way to unlock the door remotely so this will be done with a smart lock. The smart lock will be able to receive a command from the app and the Ring doorbell to unlock the door.
- iii. Face lock app: the face lock app will allow users to upload the faces of people that have access to the house. When the Ring camera sees a face at the front door, the software will run the face through the database to search for a match. A notification will then be sent to the user and the smart lock will respond accordingly to the result. The app could also keep a database with the face of the person and the time that they unlocked the door.

This technology eliminates the need to hand out keys to neighbors and babysitters or having to hide one under the door mat. There will be no need to waste money and change the locks of the house if one key is misplaced. Access to your house can be changed in seconds using the app to make your house more secure than ever.