Recitation 1: Design Charrette

Pourna Sengupta
Elizabeth Eyeson

Initial Ideas

| Tangible Device	Keys Fobs (Pourna)	Communication Systems (Pourna)	Door Handles (Elizabeth)
Problems/Issues	1. Lack consistency in capabilities, some can turn on a car from far away while others only (un)lock and set off the car alarm. 2. Can get in the way of other keys on a key chain.	1. Many are not voice activated or cannot respond or work with commands that do not adhere to standards. 2. Lack security, such as limiting communication between receivers or blocking transmission from a certain transmitter.	1. Unsanitary 2. Need lots of keys to unlock every single door in your life.
Solutions	Creating a one-all app that allows for touch to unlock for any and all locks, including your car, home, and anything else. Similar to the wallet app on an iPhone.	Create a learning AI that is similar to Siri, Cortana, and Google. Add this into an in-building system or other A/V system as a communication system. Include security protocols that screen for user authentication in order to either send or receive communications from locations inside the system.	This device could have a sanitation mechanism that automatically sprays a disinfectant onto the door as it is unlocked. If one chooses not to have a physical key, they could also opt for removable sensors that they can stick onto their door. Bringing a keychain like device in contact with the sensor would unlock the door (two factor authentication through entering a password on the app is also an option)

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Proposed Solution

Creating a digital keychain that allows a touch and go system to unlock doors and other locks allows for a sanitary and safe system that eliminates the need for bulky keychains and allows us to look to the future of safe, reliable and simple technology. Each lock is enabled with an encrypted password that can be accessed when scanned by a registered device, such as a phone. If the phone has been registered, it will
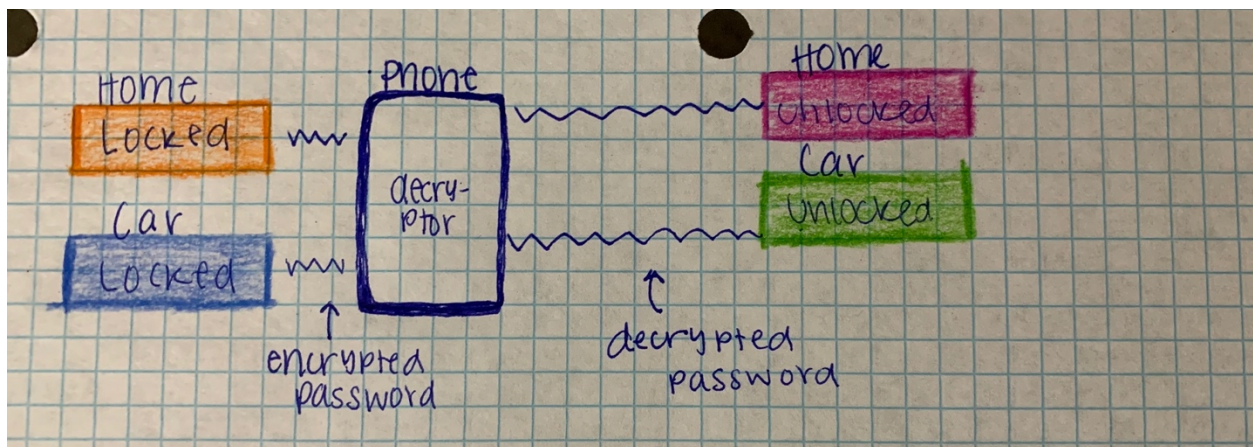
have the information needed to decrypt the password on the lock and unlock it to let the user in. This works for any lock that is configured with this technology. This also allows for a sanitary system that eliminates the need to touch a key, keychain, or lock.

Sketch
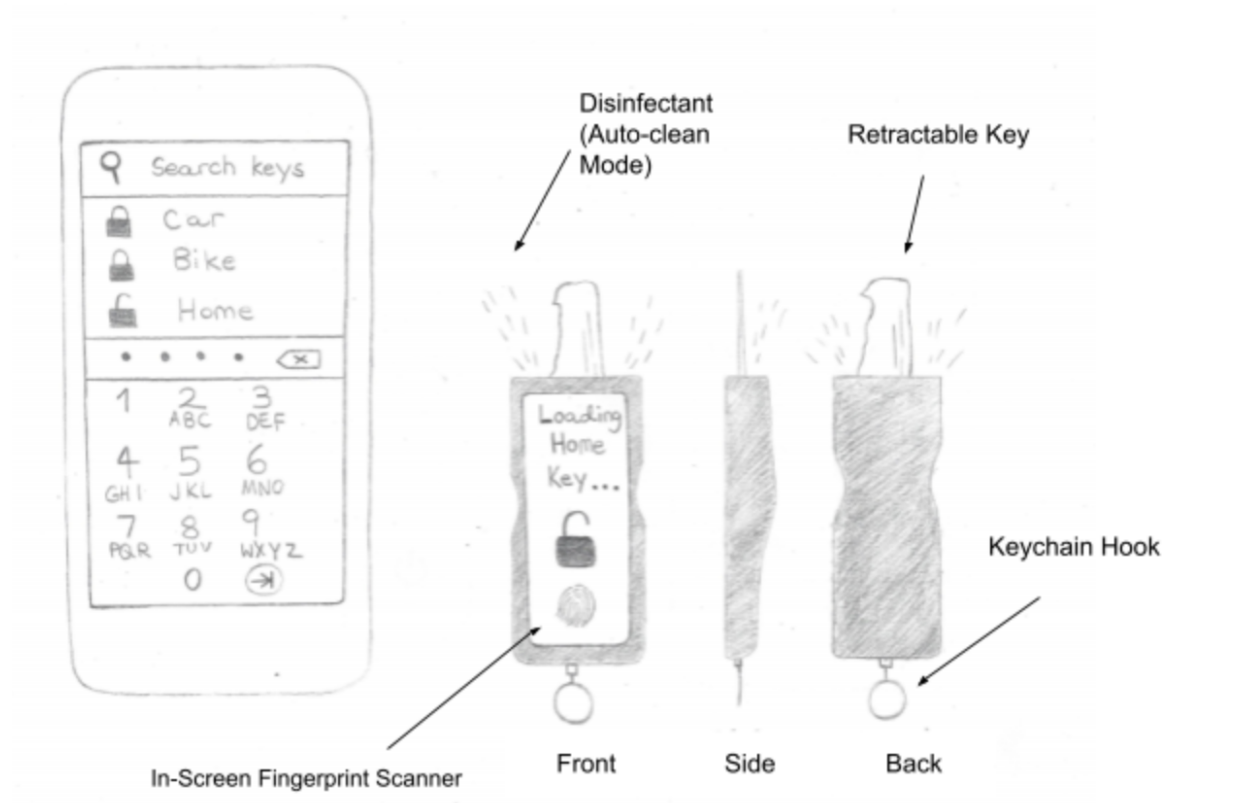
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Tradeoffs
A possible trade off to this solution is privacy/security. Considering that this device is dependent on an app for one's phone, there is always the risk of someone gaining unauthorized access to your phone. Additional security measures such as fingerprint scanning on the device itself, entering a unique pin on the app to access a specific key and restricting device activation to a narrower radius (i.e. the user must be a couple meters/feet away from the location of interest) could compensate for this tradeoff.
Another trade off to this solution is cost. Considering that this device would require components such as sensors, rechargeable batteries and a refillable disinfectant cartridge, there would be an ongoing cost to the consumer in addition to the occasional need to replace old parts. This would cost more than a one-time purchase from the locksmith. However, features such as auto sanitation and not having to carry several keys makes this solution a worthwhile investment.

Feedback (asked by Pourna Sengupta)

	Feedback	Changes
Christopher Sepp	Super useful for the one system technology we are moving towards. What if I lost my phone? Or didn't use it often? What if my battery ran out?	The application will include a card that will act similarly to the phone application, simply decrypting the lock with a fingerprint and tap against the lock.