Senior Design
Electrical and Computer Engineering
Howard University
Instructor: Dr. Charles Kim
Website: www.mwftr.com/SD1415.html

GELS (GSM Electronic Lock System)

Team Funktioneers

Michael Robinson Eden Clements
Corbin Jackson Darrell Smith Dr. Peter Bofah (Advisor)

Background

- As we start to integrate our homes into this new digital age we must make sure that we can stay safe.
- SKYNET

Problem Statement

- Security needs in the world are growing rapidly with the development of new technologies.
- A person must be able to gain access to their lock and also grant access to someone else securely.
- The core principle of the technology is to have a lock activate via voice over the GSM network.

Current Status of the Art

- Bluetooth and Wifi.
- Previous innovations are quite impressive, but are still vulnerable to security breaches if the Bluetooth network is hacked or the keypad manually hacked or removed.
- The problem boils down to issues of security and access control.

Design Requirements

-GSM Module

-Low Power Consumption

-Must operate in the primary bandwidth of 850MHz-1900MHz (FCC)

-Motor

-Power & Speed

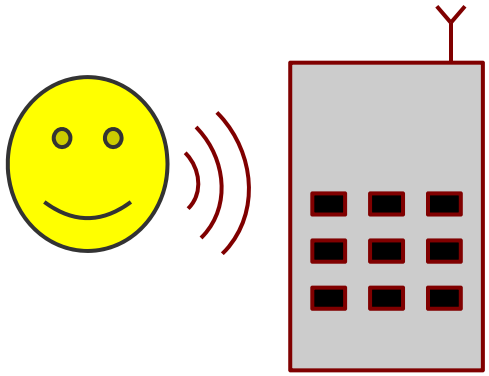
-User Compatibility

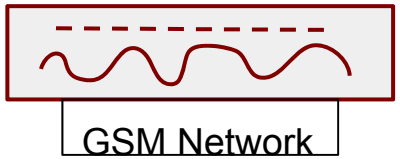
System must communicate with Smartphone

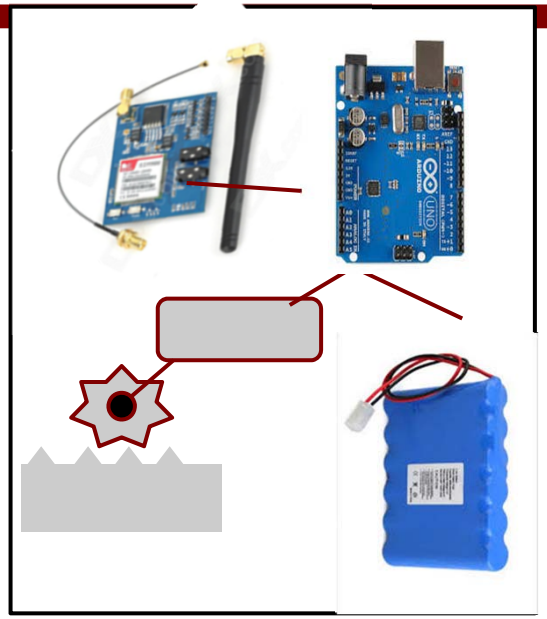
-Security

- Stand Alone System (No in home connections)

Conceptual Design

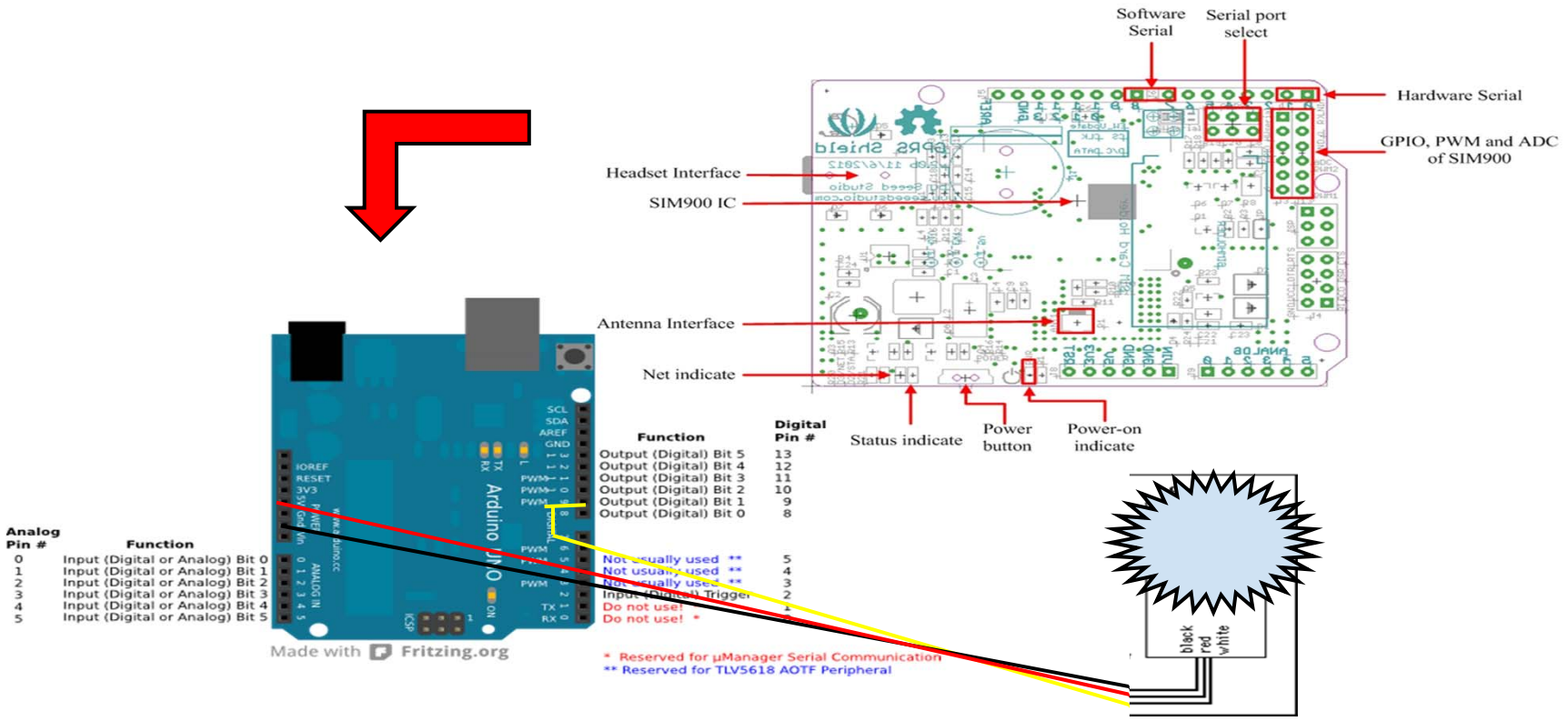






- Signal travels to module (sim card)
- Encryption recognition
- Motor control
- App

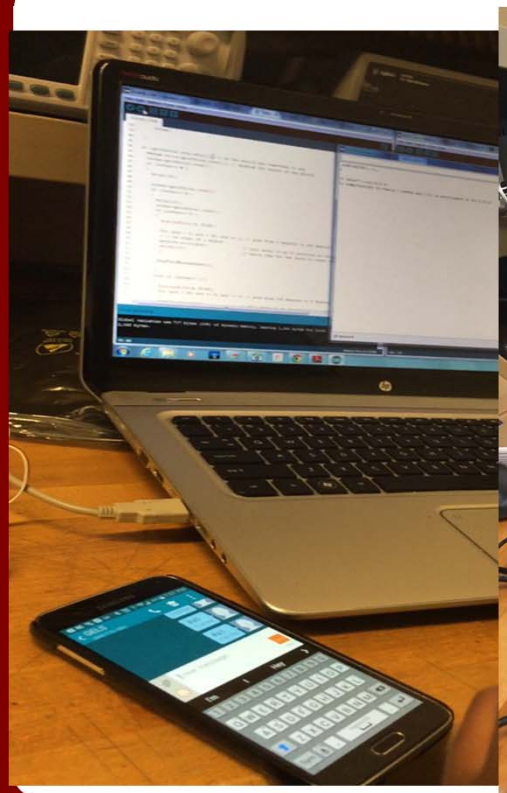
Final Design + Schematics

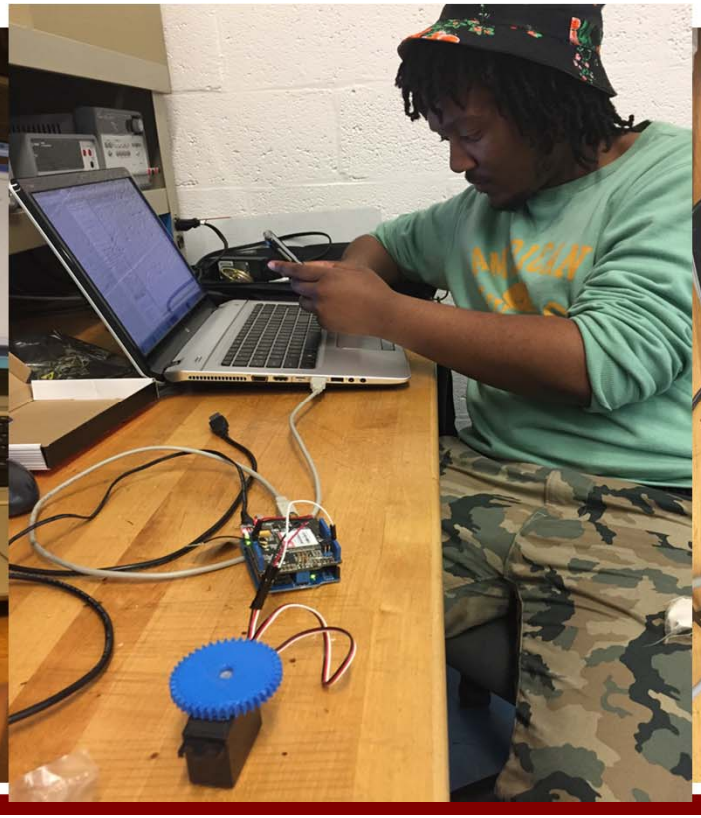


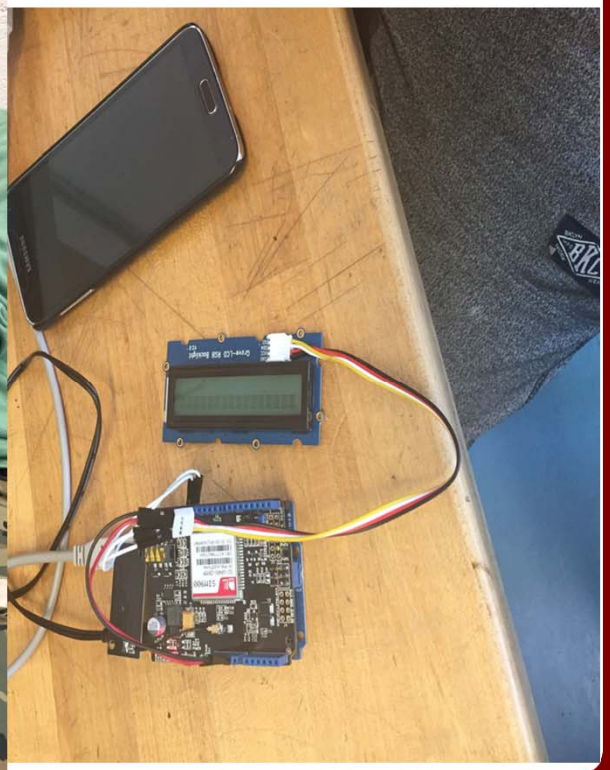
Overcome Obstacles

Lack of parts
Needing to change hardware
Time-frame
Limited access to 3D printer
Occasional lack of service

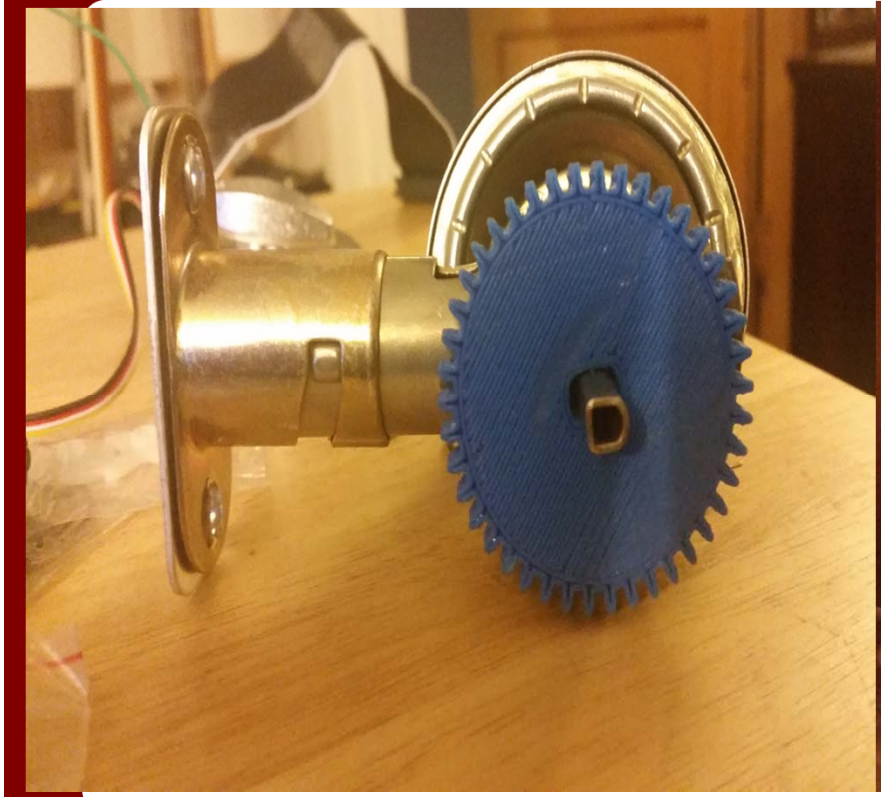
Implementation







Implementation



Implementation

Implementation

Resources and Budget

Item	Cost
Arduino Uno & Shield	$60
GSM Module	$120
Deadbolt Locks	$35
Hardware equipment	$25
Battery module	$10
Battery	$10
	Total $260

Conclusion

- An easy, secure, and efficient way of lock access.
- Unique implementation over cell phone network.
- Between losing your keys or needing to grant someone access to a door your aren't near, those issues will no longer be a problem.

Future Works

IR Sensors.
Time Setting Capability.
Further App Features.
Voice Recognition.
Secure encryption.