User Authenticated Smart Gun System

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Goal
To develop the software for a device that controls who can use a gun of which the device is embedded within, thereby creating safer environments for gun-harboring households.

Motivations and Objectives

Motivations
- Prevent domestic accidental shootings due to mishandling of firearms
- Deter gun theft

Objectives
- Develop the software for an embedded system which can control gun access via NFC identification
- Create a web application that acts as a user interface so that the gun owner can have control over which tags are authorized

Acknowledgement
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- Our Adviser, Professor Southard
- Harris Corporation

References

Hardware
- Arduino Mega 2560
- Adafruit PN532 NFC Shield
- Adafruit ATWINC1500 WiFi Breakout

Key Arduino Libraries
- EDB.h - Extended Database Library with EEPROM to store tag values
- WiFi101.h – for interfacing with WiFi breakout via SPI connection
- Adafruit_PN532.h – for interfacing with NFC shield via I2C connection

Web App Software
- Python with Flask framework for web app back end and WiFi communication
- MySQL database which stores user names and their corresponding hashed passwords

Future Ideas
Custom Arduino Library: SGD.h
An instance of this class initializes and monitors the state of the device

Dedication
This project is dedicated to Jackson Johnson, a beloved friend. May he rest in peace.

Future Uses
- We would hope to extend this project to a law enforcement setting, which would include implementing:
  - Remote status reporting of the firearm
  - Location tracking
  - Improved Security Measures of device