1. **Project number**: S20-39

2. **Project title**: Finger-Code security system

3. **Team members**: Chuang Zhao, Khandaker Hossain, Linzhang Wu

4. **Adviser name**: Chun-Tse Mechael Wu

5. **Up to 5 keywords that will help to classify the project scope**: 
   Hardware security, biometrics, multiple inputs, combinational circuit

6. **Project abstract to be shared with judges**:

   The passcode unlock method has matured in the modern day hardware security system. The method for building these devices has changed as it’s now more reliant on biometric components. In the past unlocking via fingerprint was used heavily by the industry and many devices implemented it as the go to method for securing a device. Before we look towards other methods in biometric security such as facial recognition or voice recognition there still exists room for improvement regarding fingerprint security systems.

   The standard method for password authentication is limited when it comes to the protection of a user’s privacy. Fingerprints can be recreated, and passwords are prone to being figured out. Current security systems are unlocked with a single fingerprint, and most systems only store one fingerprint.

   We seek to alleviate this dilemma by combining both the fingerprint with the password component. This model is superior to previous single component security systems because it has 2 layers of defensive measures. 3 fingerprints inputs plus passcode unlock enhance the security in the hardware level. Furthermore, we will implement alternative fingerprint inputs stored in the system to avoid unavailable fingertips due to injury or stain.

   This system can be implemented with a vault, home or a banking security system. This device would be a potential product for those who are looking to implement a security system to protect a precious commodity (gold bars, cash, gun etc).