Statement of Delivery - Interactive Prototype 3

The Concept

ZipperBan is a form of security that can be integrated into bags to prevent pickpockets from stealing your belongings. It uses facial recognition technology and proximity sensors to detect and deter thieves from reaching into your bag without you knowing. For more information about the idea and concept of ZipperBan, see the blog post: http://deco2300isabelstewart.blogspot.com.au/2015/08/video-prototype.html.

Purpose of the Prototype

The purpose of the third interactive prototype of ZipperBan is to implement further features - in this case, facial recognition technology. By implementing the facial recognition authentication system, the user can better understand how the system can detect at a deeper level the identity of the person unzipping the bag. The aim is to test the user's experience with the facial recognition authentication system ZipperBan requires for it to work correctly - from registering their face as the owner, to then testing the system in action. The prototype was also used to test the effectiveness of the facial recognition with multiple users and in multiple lighting conditions.

Form of the Prototype

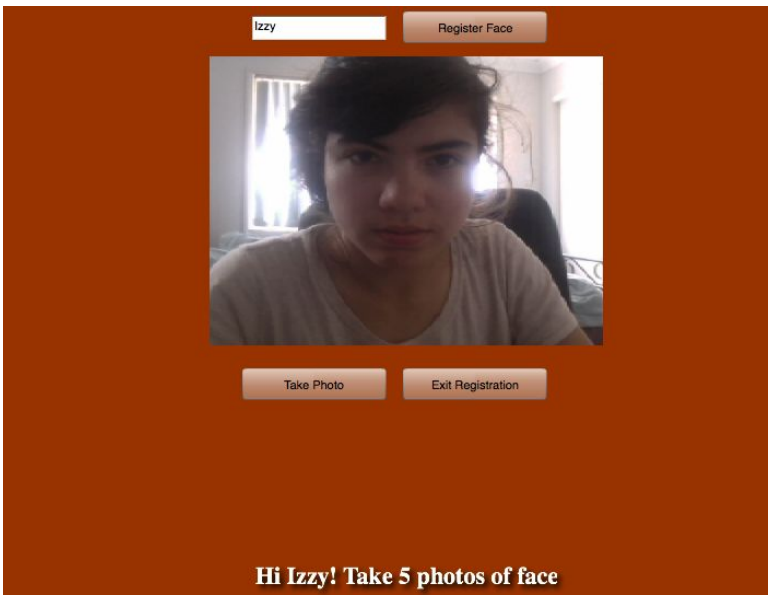
The format of the prototype is an interactive Flash Movie (digital interface) combined with a small bag with a zipper (see below images). The digital interface differs from the previous Flash Movies and focuses on purely the facial recognition technology. In this respect, the graphics and the phone alert is not included. In implementing facial recognition, an external third party library was used and is referred to in the comments of the code and can be found here: https://code.google.com/p/face-recognition-library-as3/

The work-flow of the authentication system is as follows:

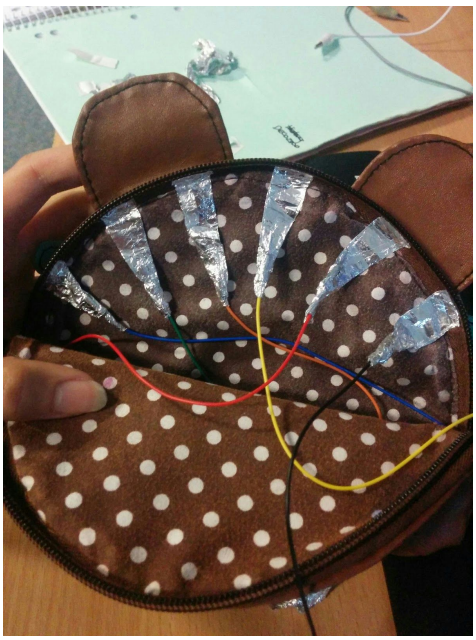
1. The user enters their name and clicks the 'register face' button
2. The screen displays live streaming of the laptop's camera
3. The user is prompted to take (and save) 5 photos of their face. 5 photos are required for the facial features to be better recognised and averaged out. The system then 'trains' using the images and names in the database (a .txt file).
4. A 'START' button appears and the user clicks on it to test the system in action, and the camera is once again turned on
5. Unzipping the bag triggers the system to take a snapshot of the user's face
6. Using facial recognition technology the system detects the identity of the face in the snapshot, and if it is not the owner, it alerts the user through the feedback text ('***THIEF ALERT!***')

It is connected to the makey makey attached to a pencil case, and uses this digital prototype from the previous project (IP2) to trigger the facial recognition system. More information on the design and implementation process of the prototype can be found on the blog.

Digital interface:



Physical interface:



Testing Approach

The main method of testing the prototype is by getting the user to interact with it and asking them questions relating to their experience with the prototype. After briefing the user on the concept of the prototype, they will then follow the prompts provided on the screen to complete each step. Once the user begins to unzip the bag they would see, if it's working correctly, their name appearing in the feedback as the person it has recognised. Then I or someone other than the registered tester would step into the view of the camera while unzipping the bag to test if the system recognises a potential thief. Direct observation will be

used while the user engages with the prototype, to determine discrepancies in how the prototype is intended to be used, and how it is actually used. While conducting the user testing, questions will also be directed to the user in order to gain constructive feedback. These questions will be along the lines of: How did you find the authentication system overall? Did the system effectively communicate that it was using facial recognition technology? Were the prompts easy to follow? How could the prototype be improved?

Decisions Involved with Constructing Prototype

In constructing the prototype, I had to make certain decisions on what physical components of the product to focus on. The ability to detect who is opening the bag is one of the main functionalities of the concept, and so it was decided to just focus on facial recognition and comparing the registered face to the face of the person unzipping. Although facial recognition is not purely physical, it is still an integral part of the concept that can be demonstrated through a digital prototype.

Throughout the development of this prototype, getting the facial recognition technology to work had proved to be an extremely challenging task. Although the system uses an external AS3 library provided by a third party developer, there is little documentation about how to incorporate the technology in the context of my prototype and what the flow of software/function calls were. This prompted attempts using other third party facial recognition libraries and even an alternative to compare faces by the difference in the image data themselves. It was decided this would not be accurate enough to be usable, and I continued and ended up successfully implementing the first option.