Secure Door Lock

Test Plan

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1. Introduction

1.1 Overview of Project

Our goal in this project is to create a secure, easy to use, and inexpensive product that has the security features that users expect from a door lock while integrating modern connectivity features that users can access through the mobile application. The secure door lock and the accompanying mobile application will allow the user to check whether their doors are locked or unlocked, lock and unlock the door, unlock the door with their or trusted individuals faces, and receive a notification with a picture of who is at their door.

1.2 Purpose of Document

The purpose of this document is to list the test cases that will verify whether the requirements listed in the accompanying requirements document are met. The required features and behaviors of the secure door lock that are listed in the requirements document need to be tested in order to verify that the user experience will be positive. In order for the features and behaviors to be tested, test cases need to be established that cover a wide variety of use cases for the secure door lock and the accompanying mobile application. These test cases will feature both usual and unusual inputs to ensure that no bugs exist in either the secure door lock or the accompanying mobile application.

2. Test Cases for Requirements

2.1 Requirement #1

The system shall display an unlock/lock button when a door lock is selected.

Test Case Input	Test Case Output
User presses the unlock button or the lock button of the door lock they have selected.	If the action is completed, the user will be notified in the mobile application that the door has been locked or unlocked. The status of the door will be updated to reflect that it is now either locked or unlocked.

2.2 Requirement #2

The system shall send a request packet to the listening service to communicate with the locking device.

Test Case Input	Test Case Output
User presses the unlock button or the lock button of the door lock they have selected.	The server will send a request packet to the listening service detailing whether the user wanted the door to be locked or unlocked.

2.3 Requirement #3

The system shall notify the user that the request has been sent and acknowledged.

Test Case Input	Test Case Output
User presses the unlock button or the lock button of the door lock they have selected.	A notification will appear in the mobile application that tells the user that the action of locking or unlocking the door has been completed successfully.

2.4 Requirement #4

The system shall notify the user of errors that occur on failure of acknowledgement.

Test Case Input	Test Case Output
User presses the unlock button or the lock button of the door lock they have selected.	A notification will appear in the mobile application that tells the user that the action of locking or unlocking the door has not been completed successfully.

2.5 Requirement #5

The system shall display a view live feed button.

Test Case Input	Test Case Output
User selects a door lock from their list of devices.	The mobile application will present a button to the user that will allow them to view a live feed of their door lock's camera.

2.6 Requirement #6

The system shall send a request to the listening service to communicate with the locking device to establish a video feed.

Test Case Input	Test Case Output
A user presses the button to view the live feed of their door camera.	The server will send a request packet to the listening service that tells it to establish a live video feed with the door lock's camera.

2.7 Requirement #7

The system shall contain a separate window for the viewing of the camera feed.

Test Case Input	Test Case Output
A user presses the button to view the live feed of their door camera.	The mobile application will open a separate window where the user can view their camera feed.

2.8 Requirement #8

The system shall automatically transition the user to the new window for viewing

Test Case Input	Test Case Output
A user presses the button to view the live feed of their door camera.	A new window will appear which will show the user a live video feed of their door lock's camera.

2.9 Requirement #9

The system shall display a live feed from the selected camera

Test Case Input	Test Case Output
A user presses the button to view the live feed of their door camera.	The user will be able to see a live view of their door lock's camera.

2.10 Requirement #10

The system shall display a "feed unavailable" notification if the feed cannot be obtained

Test Case Input	Test Case Output
A user presses the button to view the live feed of their door camera.	The mobile application will notify the user that the live view of their door lock's camera is currently unavailable.

2.11 Requirement #11

The system shall maintain a minimum framerate of the live feed of 1 frame per second.

Test Case Input	Test Case Output
User presses the button to go into the live feed	The live feed is displayed on a new window to the user and if the feed is available will show it in the correct framerate

2.12 Requirement #12

The system shall display a “My Devices” window.

Test Case Input	Test Case Output
The user presses the My Devices button	When pressed there should be a new window that appears with the users listed devices on it.

2.13 Requirement #13

The system shall list all devices that are connected to the authenticated user account.

Test Case Input	Test Case Output
The user opens up the My Devices window	The following window should have all of the users listed devices on it along with anything else necessary to the account

2.14 Requirement #14

The system shall display an “Add Device” button within the “My Devices” window.

Test Case Input	Test Case Output
The user opens the My Devices window and clicks the Add Device button	The user should be prompted to add a device to the list via identification or bluetooth.

2.15 Requirement #15

The system shall display the current status of each connected device: Lock Status, Door Open Status, Camera Feed Status, Battery Status.

Test Case Input	Test Case Output
The user opens the my devices window	The system should have each corresponding attribute of each device

2.16 Requirement #16

The system shall display an error on the list entry if it cannot communicate with the device.

Test Case Input	Test Case Output
The user attempts to add a device but the pairing fails	The system will have a new window pop up and tell the user that the pairing was unsuccessful and that it cannot communicate with that device

2.17 Requirement #17

The system shall display an “Add Device” window when the “Add Device” button is clicked.

Test Case Input	Test Case Output
The user presses the add device button	There will be a new window that appears when the button is clicked

2.18 Requirement #18

The system shall display two options for adding a device to the authenticated users device listing.

Test Case Input	Test Case Output
When the user clicks the add user button	There will be two buttons for the different paring modes in the window that appears when the user goes to pair a device

2.19 Requirement #19

The system shall notify the user when a devices is added successfully to their device listing.

Test Case Input	Test Case Output
The user attempts to pair a device	The system will give a pop up window letting the user know that their device has been successfully paired.

2.20 Requirement #20

The system shall notify the user when a device is unsuccessful when attempting to add to the listing.

Test Case Input	Test Case Output
When the user goes into the add device and the pairing fails	The system will attempt to pair the devices and when unsuccessful there will be a popup window telling the user that the pairing was unsuccessful

2.21 Requirement #21

The system shall display a window for logging into the application that contains: Credential Fields (User Name, Password), Buttons (Login, Forgot Password, Sign Up), and a Checkbox (Remember Me).

Test Case Input	Test Case Output
The user opens up the page containing the login for the system	The system should open to a new page where the fields for username and password entry should be. Also there should be a button for login,sign up, and forgot password. All of these should take the user to a new page. The checkbox if clicked will remember the entries that the user entered when they login.

2.22 Requirement #22

The system shall notify the user on successful login to their account and transition them to their home page.

Test Case Input	Test Case Output
The user attempts to login by inputting a successful username and password combo	The user should be redirected to the splash page of the system where all of the tools and options will be.

2.23 Requirement #23

The system shall notify the user on unsuccessful login attempt.

Test Case Input	Test Case Output

The user attempts to login by inputting a unsuccessful username and password combo	The system should give the user a popup window

2.24 Requirement #24

The system shall allow the user to reset their password by sending a “Request Password Change” to the listening service.

Test Case Input	Test Case Output
The user presses the change password button	The user will be redirected to the listening service for the user to create a password and then the system will update the new password

2.25 Requirement #25

The system shall allow the user to sign up by sending a “New User” to the listening service.

Test Case Input	Test Case Output
The user clicks the new user button	The system will bring the user to a new page where the user will input their username and password and the system will save this data

2.26 Requirement #26

The system will display a secondary window that will prompt for a username and email from the user.

Test Case Input	Test Case Output
The user successfully gets to the new user window and makes a user	There should be a new entry in the systems database containing the username and email combination

2.27 Requirement #27

The system shall accept login requests from the mobile application and verify against the user database.

Test Case Input	Test Case Output
The user attempts to login from the mobile application	The if the user is verified from the systems database then the output is the user gainuing access to the system from the mobile app

2.28 Requirement #28

The system shall store user information within a secure and protected database.

Test Case Input	Test Case Output
The user enters any data ie a username or password	The output is the data showing up in the systems database

2.29 Requirement #29

The system shall accept forgotten password requests and send validation emails to the requesting user account.

Test Case Input	Test Case Output
The user requests a new password from the system	If working correctly, the output should be an email that is sent to the user containing a new password request

2.30 Requirement #30

The system shall generate new user accounts from requests within the mobile application.

Test Case Input	Test Case Output
The user clicks the new user button and makes a new user from the mobile application	The new user will show up in the system database

2.31 Requirement #31

The system shall accept video data directly from the IOT device.

Test Case Input	Test Case Output

The IOT device sends the video to the system	The system that uses the video data is showing that it received some sort of input

2.32 Requirement #32

The system shall accept sensor data from the IOT device regarding: Door Open Status, Lock Status, and Battery Status.

Test Case Input	Test Case Output
The IOT device sends any sensor data	The sensor data is stored in the database ready to be used by any other part of the system.

2.33 Requirement #33

The system shall stream video data to an authenticated user.

Test Case Input	Test Case Output
The an authenticated user goes into the system and clicks the live feed button	The system will bring up a new window with the video stream in it

2.34 Requirement #34

The system shall notify authenticated users of relevant sensor data from the IOT device.

Test Case Input	Test Case Output
The system has a change in status on one of its major sensors	The system will give the user a push notification telling the user about the change in status

2.35 Requirement #35

The system shall maintain a database of registered IOT devices as well as user ownership.

Test Case Input	Test Case Output
The user has registered an IOT device with the system	The IOT device will show up in the database of the system as well as the user who

	originally registered it

2.36 Requirement #36

The system shall accept registration of new IOT devices and attach new owners from authenticated users.

Test Case Input	Test Case Output
A user registers a new IOT device using the add device feature	The user will take the IOT device and store its data in the database as well as who registered the device.

2.37 Requirement #37

The system shall scan image data from the IOT device for possible faces.

Test Case Input	Test Case Output
The IOT device uploads a picture to the system	The system will scan the image and run it through the facial recognition software and return if there is a face there

2.38 Requirement #38

The system shall maintain a registry of facial data.

Test Case Input	Test Case Output
The user inputs a picture of faces they would like to be verified faces	The system will store this data in the registry of verified faces/

2.39 Requirement #39

The system shall add facial data as a new entry when no data is currently present.

Test Case Input	Test Case Output
There is a face that appears when the system has no faces	The output will be a new face added to the registry

2.40 Requirement #40

The system shall allow the registered account to add data to existing entries.

Test Case Input	Test Case Output
A user verified use goes to edit any of the data stored in the system	If working correctly, the data that the user edited will have been changed

2.41 Requirement #41

The system shall push a notification to the registered user(s) that a face has been detected at the door: A named entity if found in the registry or an unknown visitor if not found.

Test Case Input	Test Case Output
There is a face at the door while there are facial entries	The system sends a push notification to all the verified users. If working correctly the system will be able to verify that the face that appears is either on the registry or if not will say that the face is unknown. If it is in the registry then if the push notification works, it will contain the name of the person who is at the door

2.42 Requirement #42

The system shall receive requests from a persistent endpoint to communicate with hardware servos.

Test Case Input	Test Case Output
The device sends a signal to the system	If the endpoint is working properly then the servos in the hardware will move depending on what the system tells it to do

2.43 Requirement #43

The system shall send requests related to hardware sensors to a connected persistent endpoint.

Test Case Input	Test Case Output
The system sends a request to the endpoint	If the endpoint works then the system will have the data related to the sensors

2.44 Requirement #44

The system shall communicate with hardware components using direct connection via the local raspberry pi controller.

Test Case Input	Test Case Output
The system sends a request to the controller	The controller sends the related information back to the system. If working, the system will be updated with the new data

2.45 Requirement #45

The system shall receive image data from the hardware camera via the raspberry pi controller.

Test Case Input	Test Case Output
The system requests data from the controller	The controller outputs the data from the camera and sends it to the system. If working, the system will process the image sent from the controller

2.46 Requirement #46

The system shall send image data upstream to a persistent endpoint.

Test Case Input	Test Case Output
The camera captures a image	The system successfully receives the data from the singular entry point

2.47 Requirement #47

The system shall receive view feed requests.

Test Case Input	Test Case Output
The user goes into the view feed section of the system	The system will pull all of the data from the controller on the hardware to give the user a constant stream of pictures from the Pi

2.48 Requirement #48

The system shall dynamically adjust polling rate of image data based upon: Activity Detection or Request “View Feed”. A minimum and maximum poll rate will be established as well as a cooldown rate for making rate adjustments.

Test Case Input	Test Case Output
The user goes into the view feed section of the system or there is activity outside of the door	If working, the frame rate will increase to show the user a better feed of what is outside their door

2.49 Requirement #55

The system shall display a unique window for “Recognized Visitors”.

Test Case Input	Test Case Output
A user goes into the “Recognized Visitors” section of the mobile application.	A new window opens in the mobile application.

2.50 Requirement #56

The system shall display facial profile data related to the authenticated user.

Test Case Input	Test Case Output
A user goes into the “Recognized Visitors” section of the mobile application.	The mobile application displays all of the facial profile data connected to the user.

2.51 Requirement #57

The system shall display buttons to delete or combine profiles.

Test Case Input	Test Case Output
A user goes into the “Recognized Visitors” section of the mobile application.	The mobile application has buttons next to the facial profile data which allow a user to delete or combine the profiles.

2.52 Requirement #58

The system shall allow for customization for facial profile data: Names and Profile images can be customized per the users request.

Test Case Input	Test Case Output
A user goes into the “Recognized Visitors” section of the mobile application.	The mobile application has a button that allows them to customize the names and profile images of the facial profile data.

2.53 Requirement #59

The system shall push a notification to the authenticated user from a server request.

Test Case Input	Test Case Output
A face is detected at the user’s door.	The mobile application will send a notification to the user that someone is at their door.

2.54 Requirement #60

The system shall contain an approved or denied request within the push notification to begin or stop the remote Lock/Unlock process.

Test Case Input	Test Case Output
A face is detected at the user’s door.	An approve and a deny button will be in the push notification that is sent through the mobile application. If a user approves, the door will be unlocked. If they deny, the door will remain locked.

2.55 Requirement #61

The system shall display an image of the detected face within the mobile application and the push notification.

Test Case Input	Test Case Output
A face is detected at the user's door.	The notification sent by the mobile application to the user will send an image of the detected face at their door.

2.56 Requirement #62

The system will detect a valid connection to a local network.

Test Case Input	Test Case Output
The user connects the IOT device to a network	The IOT device will tell the system that it is currently connected to a network

2.57 Requirement #63

The system shall broadcast a bluetooth signal when a connection to a local network cannot be made.

Test Case Input	Test Case Output
The user tries to connect the IOT device to a local network	The IOT device will broadcast a bluetooth signal when it detects that connection to a local network cannot be made.

2.58 Requirement #64

The system shall accept configuration files via bluetooth from a connected mobile application.

Test Case Input	Test Case Output
The user uploads config files from the mobile application	The system accepts the configuration files and changes any necessary settings. If working the settings will have changed from the old ones

2.59 Requirement #65

The system shall maintain an unique identifier that is stored internally based upon unique hardware identifiers.

Test Case Input	Test Case Output
The system is created	Upon creation, the system will create its own identifier based on factors when it was created. If working the system will be able to output said identifier

2.60 Requirement #66

The system shall store a registered owner locally.

Test Case Input	Test Case Output
A new user is made on the system	If working the new user will be put on the server as well as on its own memory