INTELLIGENT DOOR LOCK

Black Theory

Version 1.0

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Maintenance Manual

Version 1.0

Contents

A. Introduction

1. Purpose Document

The purpose of this document is to educate the end user on how to maintain the equipment so that it stays as efficient as possible.

2. Audience

The audience is the end user. Whether it be a homeowner or a business owner.

B. System Description

1. Key Features

Cloud-based facial recognition, responsive hardware and software, and all in one design.

2. Inventory

- *HC-SR04 - Ultrasonic sensor*
- *TSL2561 - Lux sensor*
- *LED - Cathode LED RGB light*
- *Raspberry Pi 3B*
- *D415 Intel-Realsense RGBD camera**
- *Bright Pi v 1.0*
- *Main script (controls all software functionality).*
- *Door Lock 12V*
- *DC-1561W Magnetic contact*

3. Environment

Hardware, the intelligent door lock kit. Software, AWS Rekognition, AWS Kinesis, AWS S3. Material, A door or entry that has access to 12V power source.

4. System Operations

The system is designed to detect facial recognition for door access as a means of security. The home or business owner will have access to add as many as 5 profiles on the system for door access. If any of the 5 people approach the door, they will be granted access into the home or business. If there is no match upon facial recognition, access will be denied.

5. System Architecture

The Pi will wait on the ultrasonic sensor to detect something close to and it tells the camera to start recording. Then the video is packaged and sent to AWS for processing, and it will *return a value. The door will unlock or stay locked based on this value.*

C. Product Installation

1. First-Time Users

When you first receive your intelligent lock, you must create a S3 Bucket on AWS using your

account. You will then use the AWS Key AWS Secret Key that you are given, that is tied to only your account, to change the .config file in the .aws folder to match what you have.

2. Access Controls

There is no password to enter the pi, you can add a password but that will require you to entire everytime you restart the pi. Which will be difficult since it will be mounted onto a door.

3. Installation

The camera should be installed at eye level. All software should be pre-installed and tested before using the system.

4. Configuration

To change the AWS S3 bucket you are sending data to simply go to the .aws folder and open the .config file and enter your AWS Key and AWS Secret Key. You can also change what file format it will output and what AWS region you use.

5. Starting the System

Simply turn it on and the scripts will start running automatically.

6. Stopping the System

Unplug the Pi from the wall.

7. Suspending the System

Cover the ultrasonic sensor or turn off the system entirely.

D. System Usage

1. Instructions

In order for facial recognition to be accurate the camera must be placed at an eye level measuring from the bottom of the door. This will ensure the camera is able to capture a full image or video of the person approaching the door.

2. Conventions and Error Messages

terminal message match - Facial recognition has detected a profile match. Door access has been granted.

terminal message no match - Facial recognition did not find a profile match. Door access has been denied.

E. System Management

1. Change Management

The owner of the system will be in charge of making sure the door lock system remains up to date. So long as the system is connected with wifi, automatic updates will be detected but some may require manual approval from the owner.

2. Configuration Management

All system configuration management is handled by the Pi and AWS.

3. Release Management

The process for release management is first to ensure the system has power and is ready to use. The second step will be to set up to 5 facial profiles into the system. These profiles will have door access. Any other door activity will be denied door access. The third step is to test the door by making sure your profile has been added, approach the door and test the facial recognition.

4. Security Administration

The security on the system is reliant on AWS Security Policies. Since the Key and Secret Key you enter is virtually impossible to crack as one is 20 characters and the other is about 40 characters.

5. System Administration

The system comes pre-administered on startup by default, in order to change this setting the user will have to manually enter the raspberry pi and change the permissions.

F. System Maintenance

System maintenance will happen automatically so long as the device remains connected to wifi. Some updates might require manual approval from the owner.

G. Database Administration and Maintenance

All of the database is maintained by AWS and is held on their servers.

H. Backup and Recovery

There is a backup image for the current system already made. Data recovery is not needed as everything is saved on the AWS S3 Bucket.

I. Service Management

Whenever the device is restarted the scripts will check all dependencies and packages for updates.

J. Key Contacts

For:

- *Hardware related issues contact: Angelica Reyes - angelicareyes39@my.unt.edu*
- *Software related issues contact: Fadi El-Nemri - fadiel-nemri@my.unt.edu*
- *Database related issues contact: Matthew Boyer - matthewboyer@my.unt.edu*

K. Roles and Responsibilities

Software Manager – Fadi Nemri

Hardware Manager – Angelica Reyes

Database Administrator – Matthew Boyer

L. Regulatory Requirements

We broadcast at a frequency within the FCC radio spectrum allocation guidelines.

M. FAQs

1. *What are the maximum profiles that can be set up at once? 100 facial profiles*
2. *How does the door detect facial recognition? via AWS Rekognition software*
3. *Does the system remain powered on at all time? Yes, however, the system will remain idle until the motion sensor signals activate all the other parts.*