Cashierless Convenience Store: AmaZOT! Go

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Our Problem

The average grocery store finds customers waiting around 5 ½ hours annually in checkout lines alone. By eliminating cashiers and having checkout automatically occur on exiting a store, we believe we can reduce this time to zero hours.

How We're Doing It

Our project uses Raspberry Pis, range sensors, cameras, special-built shelves, and a lot of homecooked software to automatically update our customers' digital shopping carts according to what's in their physical one. Our Pis will verify which item has been picked up, and facial recognition software will let us know who did it. All of this information will be able for viewing on an Android that is backed up by Google's Firebase database software.

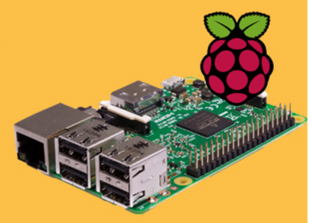
What Hardware We'll Use

Webcam

- Verify customer face for entry, item pickup, and exit

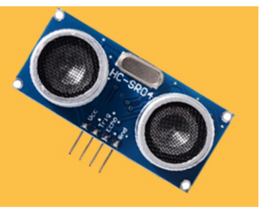
Raspberry Pi

- Installed in shelves and camera mounts
- On entry and exit, verifies face with account in database
- Range sensors monitor when items are picked up, tell camera to capture customer's face



Ultrasonic Range Sensor

- Detects when item is moved from shelf



What Software We'll Use

Google Firebase

- Cloud Database for account management, live cart updates
- Will communicate with Pis and app

Java

- Coding Language used in Android App development
- App will communicate with database

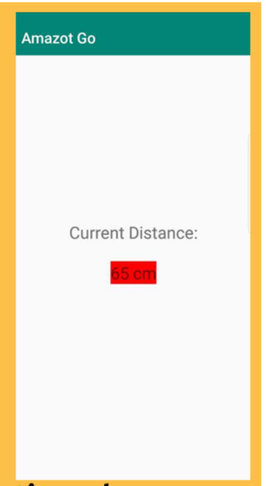
Python

- Coding Language used in Raspberry Pis

What We Have

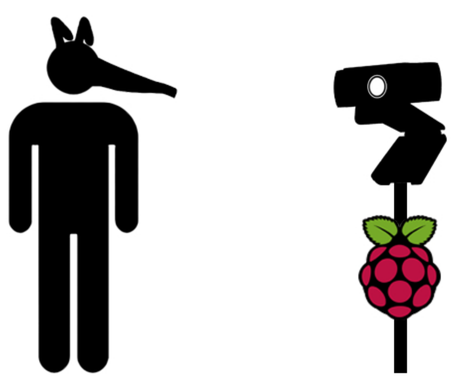
Android App

- Communicates directly with real-time database
  - > Database updated by Raspberry Pi
- Range displayed on app updates about every half second
- By the end of the quarter, we hope to have an improved app that will send a notification when an item is moved rather than constantly updating the range of each item
- We'll also implement our account system by this quarter to start testing in Winter. Users only need a username, password, and photo to set up an account



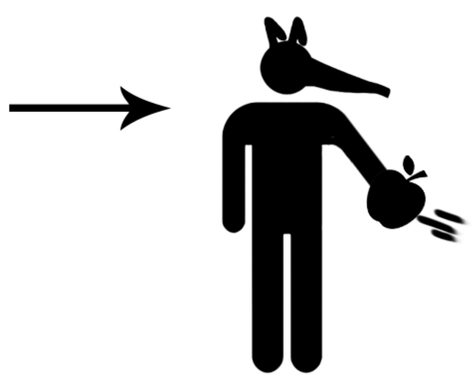
ENTRANCE

1) Facial Recognition Verifies Customer



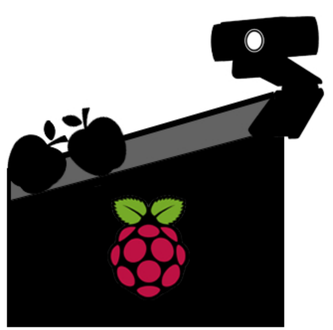
IN STORE

2) Customer Picks Up Item - Special-Built Shelves Cause Remaining Items to Slide Forward



3) Raspberry Pi and Range Sensor Integrated in Shelves Identifies Item Has Been Taken

4) Webcam verifies face of customer with database. The item is added to the user's digital cart



EXIT

5) Exit Camera Verifies User, Transaction Completed Automatically