Alfred
(Wifi-Enabled Automated Mixed Drink Maker)

Team 15:
John Fouad, Ben Ivaldi, Chris Wong, Pat Barron

April 20, 2018
Team Members

Chris

Advisor: Professor Moritz

John

Ben

Pat

Department of Electrical and Computer Engineering

Advisor: Professor Moritz
Problem Statement

- **Time-Saver:** People wait too long at bars trying to get the bartender’s attention to order simple mixed-drinks

- **Eliminates Bartender Pouring Errors:** Bartenders can disproportionately pour drinks or provide the wrong drink

- **Alleviates Congestion:** The amount of people around the bar trying to order a drink is a nightmare
System Specifications

- Order through mobile device
- Pour a perfect drink in under 2 minutes
- Bartender can insert choice of alcohol (750mL) and mixers into dispensers
- Choice of 4 different drinks
- Does not spill the drinks
- Tab system to order drinks
- Drink served to correct customer using door system
- Rotatable base to access different cups to dispense the liquids
System Specifications (cont’d)

- 8 cups with ice placed onto base
- 15.9” diameter base
- Dispenses correct proportions of liquids into each specific drink
- Failsafes:
  - Sensor to make sure cup is removed before closing door
  - Sensor to detect correct orientation of base
Block Diagram

Wall AC/DC Converter
- 120VAC to 12VDC/3A

Control
- Raspberry PI
- Drink/Motor Control
- Bottle monitoring via pump rotations

Motor Drivers
- TB6600 Stepper driver (x7)

Rotating Base
- Lazy Susan
- Nema 17 Stepper Motor

Pouring System
- 3D printed peristaltic pumps
- Nema 17 Stepper motors

User Retrieve
- Receive code via mobile interface and scan at device for drink retrieval

Server
- Handles requests from user interface and sends data to PI

Delivery Door
- Servo motor controlled
- IR LED and receiver for safety/drink taken

Sensor Feedback
- IR LED/receiver for base calibration
- Serving door feedback
Proposed FPR Deliverables

- Splash Guards will be mounted near the tubing - currently liquids splash a little when liquid level increases in cups
- PCB completed
- Outer casing for whole project
- Secure the password reset for accounts
- Fully automated through Pi
- Completed algorithm for base rotation
- Personal identification code for completed drinks (barcode/QR code/keypad)
PCB
PCB
## Cost of Materials

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QUANTITY</th>
<th>PRICE PER UNIT</th>
<th>TOTAL PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nema 17 Stepper Motors + Drivers</td>
<td>6</td>
<td>$24.99</td>
<td>$149.94</td>
</tr>
<tr>
<td>Silicon tubing</td>
<td>3</td>
<td>$9.99</td>
<td>$29.97</td>
</tr>
<tr>
<td>Ball Bearings</td>
<td>2</td>
<td>$9.02</td>
<td>$18.04</td>
</tr>
<tr>
<td>Screw Assortment Kits</td>
<td>2</td>
<td>$21.99</td>
<td>$43.98</td>
</tr>
<tr>
<td>USB Keypad</td>
<td>1</td>
<td>$8.99</td>
<td>$8.99</td>
</tr>
<tr>
<td>Power Supply</td>
<td>1</td>
<td>$17.99</td>
<td>$17.99</td>
</tr>
<tr>
<td>PCB</td>
<td>5</td>
<td>$2.71</td>
<td>$13.55</td>
</tr>
<tr>
<td>Lazy Susan Base</td>
<td>1</td>
<td>$17.95</td>
<td>$17.95</td>
</tr>
<tr>
<td>Raspberry Pi</td>
<td>1</td>
<td>$34.93</td>
<td>$34.93</td>
</tr>
</tbody>
</table>
Cost of Materials (cont’d)

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QUANTITY</th>
<th>PRICE PER UNIT</th>
<th>TOTAL PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>32GB MicroSD</td>
<td>1</td>
<td>$12.99</td>
<td>$12.99</td>
</tr>
<tr>
<td><strong>Total Price:</strong></td>
<td></td>
<td></td>
<td><strong>$358.32</strong></td>
</tr>
</tbody>
</table>
Questions??