

Portfish

Keith Porter and Varun Vishwanathan

{kbporter, varuvish}@umich.edu

Objective:

Hosting events can become a very tedious task. Event hosts must tend to all their guests needs while at the same time socializing with them. This responsibility can become a very tiring task and can take away from the fun experience of hosting an event. We aim to satisfy the needs of event guests so as to alleviate the requirements of event hosts.



Problem Description:

One facet of the event management that is particularly menial is a host's obligation to take care of guests' thirst. The host needs to satisfy a large audience in a small amount of time while and can only help one person at a time.

Current solutions do not fix these issues effectively or affordably. While some products may address specific problems, they do not address the broad range of challenges at hand. Some solutions are very versatile but quite costly and slow (eg. bartender) whereas others are cheaper but less effective (eg. a cooler of drinks).

Proposed Solution:

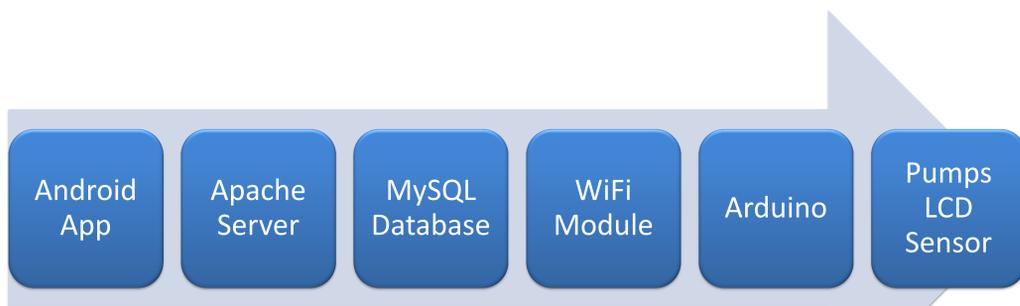
Mobile App Controlled Drink Mixing Machine

The Portfish is an Android app controlled robotic bartender which will take in a drink order, make it, and notify the user when their drink has been served. It can support many drinks requests at once, processing them on a turn-by-turn basis.



We have created a functional prototype of this proposed solution, complete with wood framing, bottles, tubing, and all necessary hardware and software as described below.

Our Implementation:



The pumps are used to push the drink components from their respective containers to the recipient's cup. The pumps are controlled via the digital output pins of the Arduino in conjunction with transistors and an external power supply.



The IR distance sensor is used to determine if a cup is placed in front of the output of the machine. The sensor returns an analog value to the input of the Arduino indicating the distance to the nearest item in front of it.



The serial LCD screen is used to output any configuration information and the current status of the machine - waiting for an order, waiting for a cup, processing an order, or completing an order. When processing an order, the name of whoever ordered the drink and the name of the drink is displayed. The screen is controlled through the digital output pins of the Arduino and powered by an external power supply.



The drink ordering view of the Android application. This shows the list of pre-formed drink mixes that are available to order. The user can also design custom mixed drinks.



The drink history view of the Android application. This shows the who ordered drinks recently and what they ordered. Name and photo are derived from the user's Facebook.



The server and the database together process and store drink requests and then push those requests to the machine when it is ready.



The WiFi module functions as a server mounted on the machine. The Apache server then runs a script to act as a client and connect to the WiFi module. The information for the current drink order is then embedded in the URL that the Apache server uses to access the WiFi module.



The Arduino is designed to configure the WiFi module to connect to the local network and then process all drink orders received. This is accomplished by integrating pump control to actually fill the cup, an LCD to output the drink request information, and a sensor to detect if a cup is present.

Conclusion

We successfully implemented a great drink management experience that allows a user to order a drink from his or her phone, place a cup in front of the Portfish machine, and receive their drink as requested.