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Section F

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Project Summary and User Feedback

My project is basically a modern take on the manual produce entry found at supermarkets. What is traditionally a tedious process, searching through codes to enter and rummaging through endless menus, becomes as easy as a few strokes of your finger and holding the item in question up to a camera. However, because you are able to enter your own items and create your own database, the project isn’t restricted to just produce – you could use it to identify any items you want. The only requirements are that the items have a name, and a color!

The primary module that I use is the Leap SDK, of course along with the essential piece of hardware, the Leap Motion. I use the Leap to not only get around the entire interface, but also to write using only your index finger, and then convert the resulting input to text. This is where Tesseract, a Google open source OCR engine, comes into play. Combining Tesseract with manual input allows you to quite accurately write with your finger and get useful text out as a result. Finally, I combine all of these modules with OpenCV, which is used to take RGB information from the item held up to a webcam. The combination of these three modules allow you to quickly write out the first two letters of an item you are looking for in your database, and then hold the item up to the camera to identify it.

The user interface is made to work with the Leap specifically. Users can easily and intuitively swipe between screens using a finger motion not unlike that used on smartphones; items can be chosen from a menu by simply hovering over its button and “pushing” it down. The use of the Leap allows the user experience to be both enjoyable and intuitive, and gives the user the ability to get between screens and menus rapidly.

In terms of user feedback, I will discuss a feature that many people said I should implement, which I did. I will also discuss a feature that a few people recommended, however I didn’t include for a few key reasons.

First off, I received a lot of feedback to include a tutorial. The Leap Motion is unfortunately a pretty finicky device, and takes quite a bit of playing around with to get used to its range of sight and the different depth locations. Many users had difficulty figuring out exactly how to get around without any information being provided to them. As a result, I implemented a tutorial screen at launch that clearly demonstrates where the “sweet spot” of the Leap is, as well as provides the user with information relating to the depth region they are in, all in real time. By playing around in the tutorial screen for a minute or so, the user becomes familiar with the Leap, and operating the program becomes a much easier task.

The piece of feedback that I decided to not include was showing the location of the user’s index finger at all times, represented by a dot. I tried to do so, but many issues appeared in its implementation. Firstly, except for a rare screen or two, the Leap input consists merely of swipes that don’t look at the exact location of the finger; including a dot displaying the finger location here would be unnecessary and distracting. Secondly, in the rare screen where displaying the finger location would be somewhat useful, the dot used to represent the location covers vital information on the screen (no opacity available in Tkinter, unfortunately), and it lags a decent amount since it has to update in real time, providing a less-than-satisfactory user experience. For those reasons, I decided not to implement this feature.