CSE 440
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Task Analysis Report

Nutriview

Team Members

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Problem & Solution Overview

Eating healthy is important, but can be difficult. We hope to help people overcome two main challenges associated with healthy eating: first, the challenge of analyzing the healthiness of their current diet, and second, the challenge of selecting healthy foods. Nutriview will help people analyze their diet by automatically logging food consumption, and providing users with a dietary analysis. Nutriview will promote healthy food choices by providing useful and unobtrusive recommendations when users are deciding between foods. By helping people analyze their diet and choose healthy foods, Nutriview can make eating healthy an easier goal to achieve.

Task Analysis

Users

We are building this application to appeal to a wide variety of people; we expect that Nutriview can be actively used in anyone's daily lives, no matter what their demographic is. Everyone who has a Google Glass will be able to use this open application to improve their eating habits and make healthier choices.

Current Tasks

There are a three main tasks that users currently perform that Nutriview can assist with--choosing items on a menu, picking out groceries, and analyzing nutritional intake. Together these three tasks make up the core of the application. First, Nutriview can help users make a selection when they are choosing a food item on a menu, such as when they are eating at a restaurant. They can enter the Choice Mode and interact with the augmented reality that Glass presents while they are looking at the menu in question, and make a decision based on the information Nutriview provides. Second, users can select and view nutrition analytics that Nutriview passively collects over time. Third, users may interact with a companion app to modify their personal profile, which will contain info about dietary restrictions, allergies and other info that will be used to customize the application's interactions with the user.

Desired Tasks

As much as possible, we want Nutriview to be a companion that assists people in making

everyday choices, aiding in the decision process rather than being a library resource. We want users to be able to get information about any and all things they consume, which they can use for any purpose they see fit. Tasks like performing complicated calculations on the specific amounts of nutrients in a food or using other parameters such as food price in order to make decisions is not something Nutriview is meant to do.

Learning Tasks

Google Glass as a platform is easy to navigate, and this leads to easy learning of tasks within Nutriview. Many tasks require minimal user interaction; a user simply swipes to a mode and Nutriview starts working immediately. For tasks that require more user interaction, such as viewing nutrition statistics, the hierarchy of our application is simple to follow and there are no useless screens that obstruct the user. Additionally, many tasks support voice commands; theses tasks are clearly indicated by example dialogue that is shown on a particular screen that lets the user know what commands are available to the user.

Task Locations

Nutriview tasks most often deal with analyzing food and helping users make good selections with what they consume. As such, we expect most of the tasks on Nutriview to occur in typical places where people have to make decisions on food: a grocery store, a restaurant, or a cafeteria.

Customer – Data Relations

Nutriview passively collects data on what the user consumes throughout their day and over time it aggregates this data into useful information that the user can later access and view for personal use. The data that the user inputs into their profile is also important as it helps Nutriview make better decisions for the user when they are making food selections.

Other Tools

In addition to the application itself, users can access their Nutriview profile online to make changes; these changes propagate to the Nutriview application through the cloud on Google Glass and Nutriview then uses this updated information immediately.

Cross-Customer Communication

As Nutriview is a personal use application, there really is not a need for users to communicate with other users of the application. One idea we considered was some kind of social network plug-in, but often times a person’s diet is a sensitive topic, and it wouldn’t be something they would want to broadcast to the whole world.

Task Frequency

We expect the frequency of tasks to vary greatly between users. However, for a typical user, tasks could be performed on a daily basis, if not several times a day. For example, from our Contextual Inquiry we discovered that many people eat out much more often than they cook, so each time they eat out they would be using Nutriview. Tasks such as changing user profile information or viewing nutrition statistics will probably occur less frequently.

Task Time Constraints

Nutriview tasks are not bound by time constraint; there are no time-out screens or tasks that have a time limit to complete. Many tasks are nearly instant in themselves already; for example Choice Mode occurs automatically whenever a user enters an environment that Nutriview can interact with.

Error Handling

Nutriview may automatically enter Choice Mode, an augmented reality view, by mistake. In this case, the user can exit from the mode by swiping down.

Storyboards

We produced three separate designs for the main three aspects of our application: flow design, user profile design, and overview/visualization design.

Flow Designs

Flow Design 1

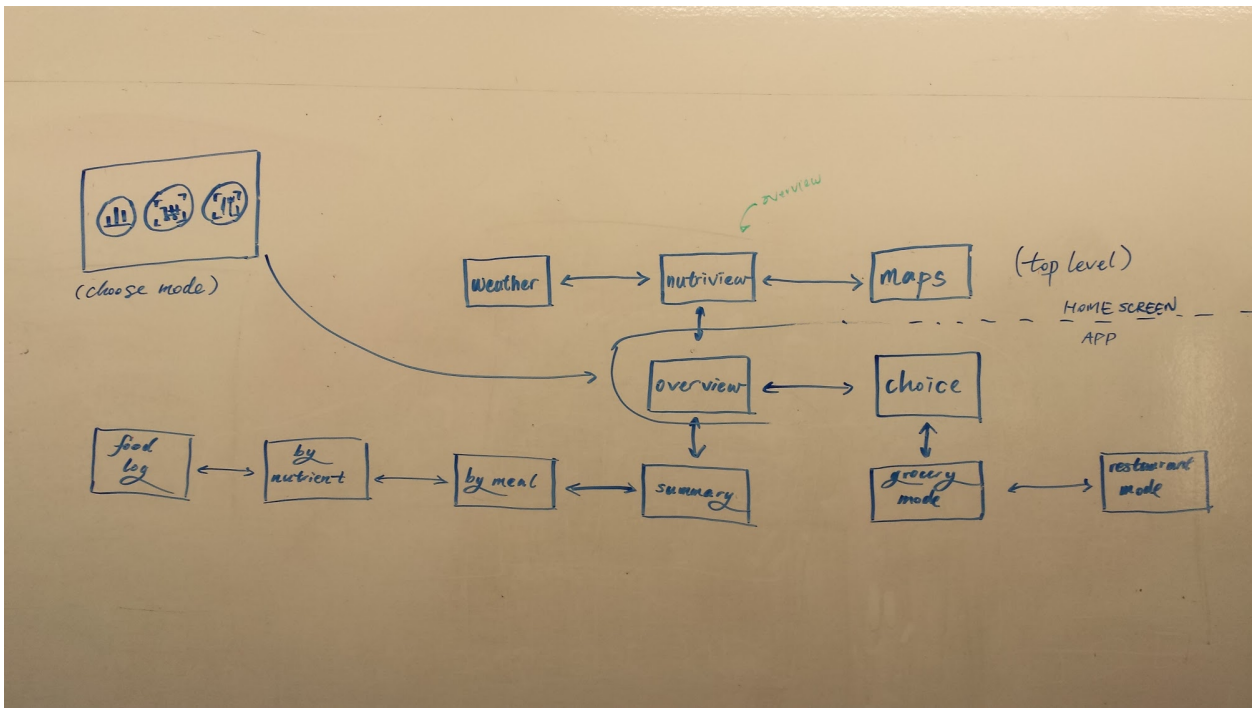

Figure A: First overall workflow design. The two top-level views within the app are overview mode and Choice Mode. Once overview mode is entered (trackpad motion: press), the user can switch to other subviews (trackpad motion: side-swipe) to view their analytics in different visualizations. When Choice Mode is entered (trackpad motion: press), the user can switch to other subviews (trackpad motion: side-swipe) to choose between Grocery Mode and Restaurant Mode.

Flow Design 2

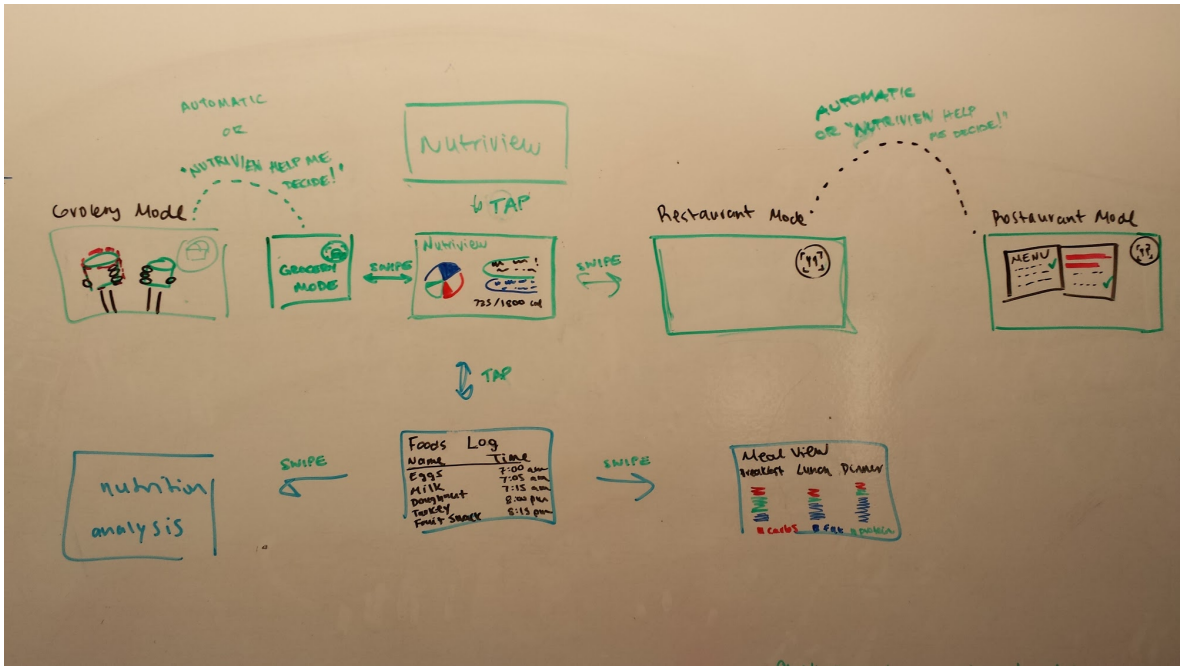

Figure B: Second overall workflow design. The three top-level views within the app are Overview Mode, Grocery Mode, and Restaurant Mode. The user can switch to other top-level views by side-swiping. Once Overview Mode is entered (trackpad motion: press), the user can switch to other subviews (trackpad motion: side-swipe) to view their analytics in different visualizations.

Flow Design 3

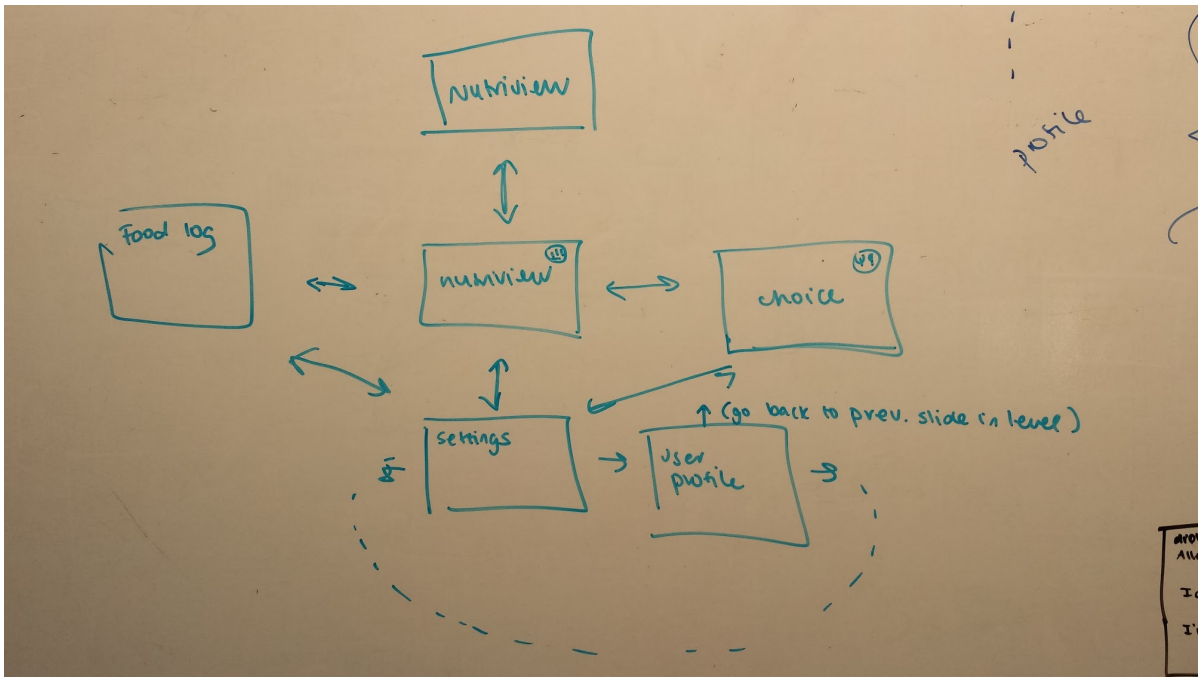

Figure C: Third overall design. The three top-level views within the app are overview mode,

Choice Mode, and food log. “Entering” (trackpad motion: press) any top-level view takes the user to the settings view. From there, the user can side-swipe between it and user profile or go up one level (trackpad motion: swipe down) back to the three top-level views.

User Profile Designs

User Profile Design 1

Figure D: First design of user profile building. Everything is voice-controlled; this screen gives hints to the user about what sentences they can say to add a dietary restriction. When an input is done, the screen transitions to Figure E.

Figure E: First design of user profile building. Everything is voice-controlled; this screen shows the user what restrictions they have already inputted through voice.

User Profile Design 2

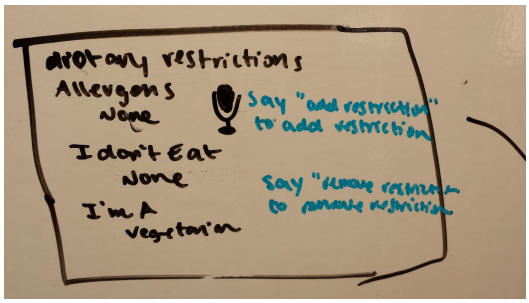

Figure F: Second design of user profile building. Everything is still voice-controlled, but explicit voice commands are hinted, and existing restrictions, even if none have been specified, are explicitly enumerated.

User Profile Design 3

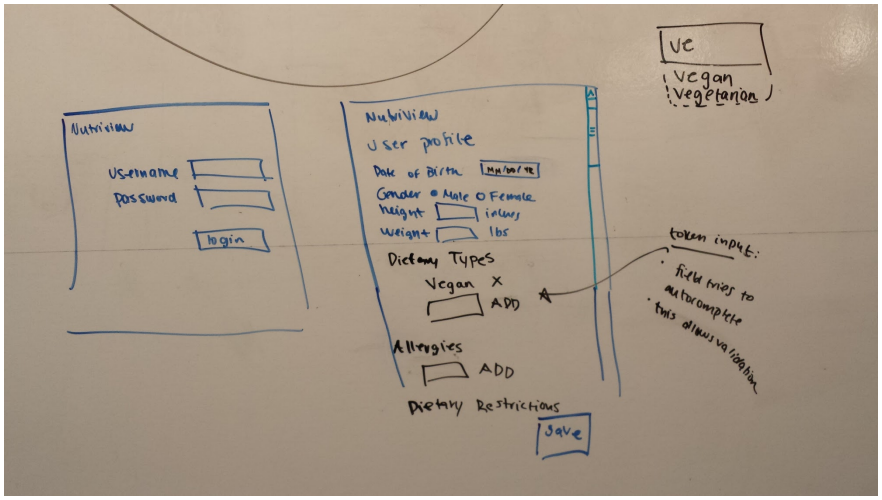

Figure G: Third design of user profile building. The construction of the user profile is offloaded into a companion app residing on a smartphone. This companion app would communicate with the Glass app through a wireless protocol, such as Bluetooth. The companion app may also run in a web browser, in which case the data sharing can be funneled through an account such as Google account. The companion app allows for a more elegant way to present form controls and inputs that are too complex to be shown on a Glass.

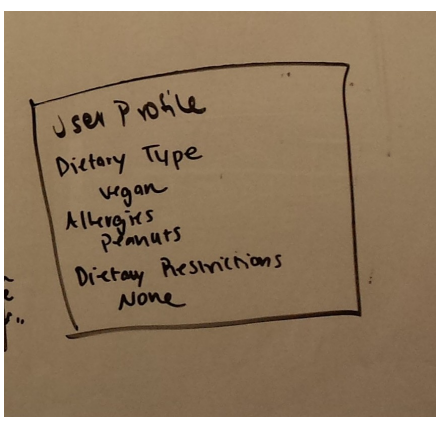

Figure H: Third design of user profile building. This is a summary of the user's profile, which is viewable in the glass interface, but not editable.

Overview Screen & Visualizations Designs

Overview Screen & Visualizations Design 1

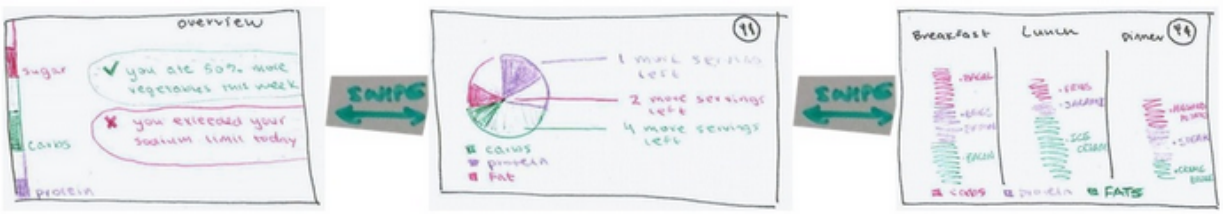

Figure I: First design of overview screen and visualizations. The user is presented with three views: in summary view, there is a pie chart and small notifications / alerts that show abrupt changes in nutrient intake; in servings view, in the middle, there is a recommendation for how many servings the user has left to eat; in meal view, on the right, there are three stacked bar charts showing nutrient proportions broken down by meal;.

Overview Screen & Visualizations Design 2

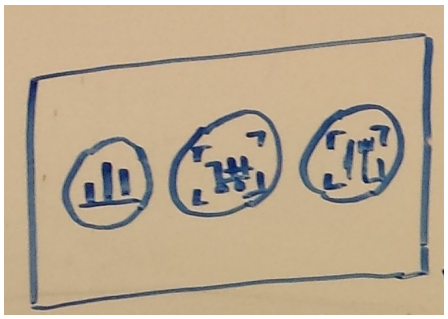

Figure J: Second design of overview screen and visualizations. This “overview screen” is not a true overview; it is a mode chooser for the user to choose the grocery mode and the Restaurant Mode, by swiping left or right. There are no analytics visualizations in this design.

Overview Screen & Visualizations Design 3

Figure K: Third design of overview screen and visualizations. The user is presented with two views: in summary view, there is a pie chart and small notifications / alerts that show abrupt changes in nutrient intake; in foods log, a most-recent-first list of intake / food items consumed is shown.

Selected Interface Design

Design and Reasoning

Of the designs we created, we selected the third design from each category. Together, they make up our selected interface design:

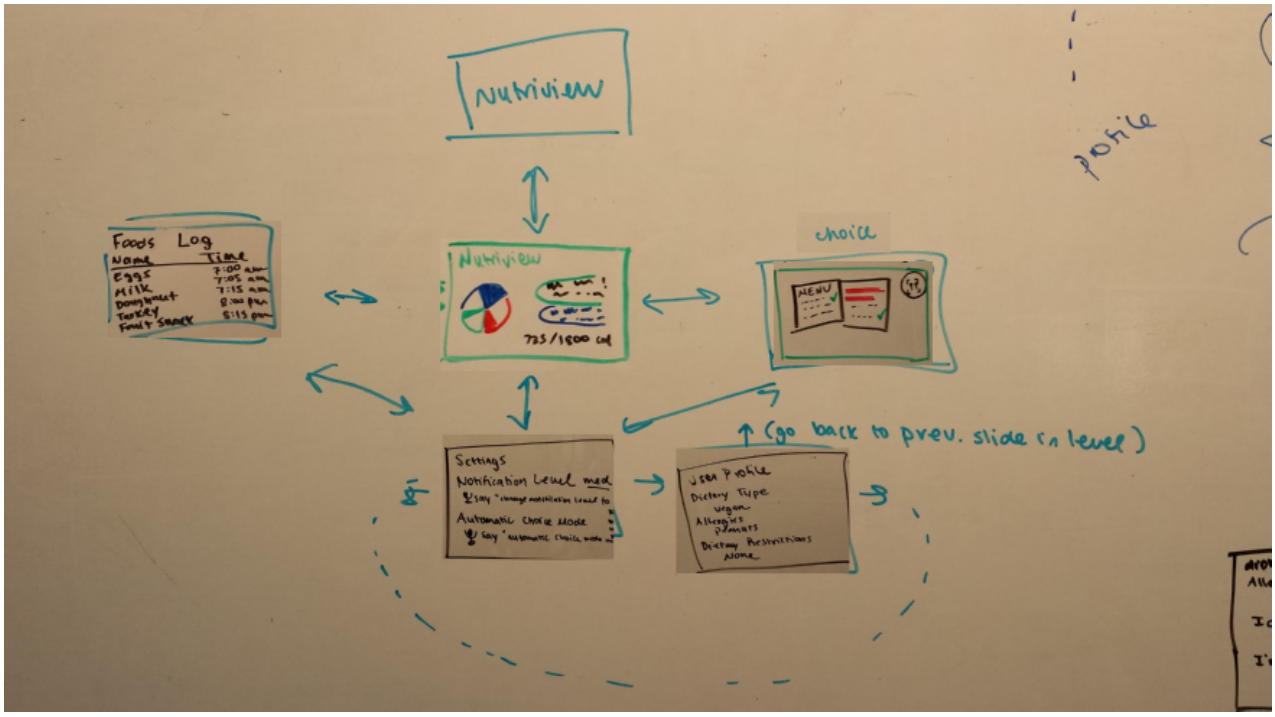

Figure L: Overall flow of chosen design. Companion app for building profile is not pictured.

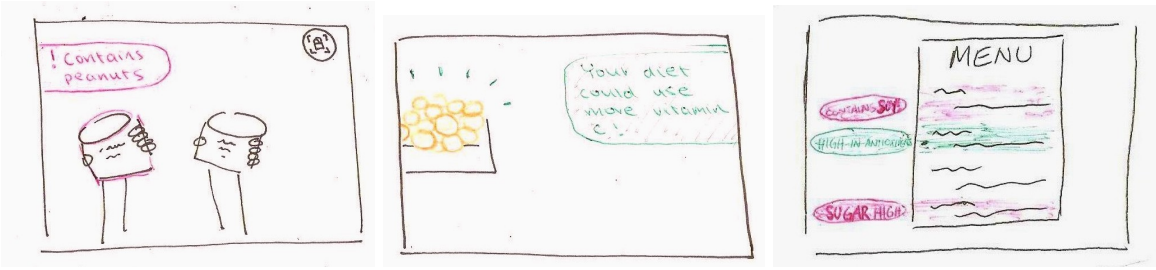

Figure M: Various screens in Choice Mode.

We discovered through our contextual inquiry that many people don't think about food in terms of how much calcium, potassium, iron, etc. they consume. Based on this knowledge, we wanted our app to be useful even to the least nutrition conscious person. This was our reasoning for making the overview screen the first thing anyone sees when entering Nutriview. It provides a general recap of the nutrition already eaten in the three categories people watch for the most (fats, protein, and carbs) and any warnings for the user where they might have indulged too much in. This gives the user the most important information with the least amount of effort.

From there, we have another card that lists the foods you've had that day. We chose a daily food log and chose not to provide a detailed history because it would be too complex. We felt a detailed history would be more appropriate for the companion app. For the same reason, we chose not to provide complex analytics visualizations like in Figure I. Our purpose is to help people make better food choices, which is very much an active activity. Part of that is providing a brief history to give the user context, but the main part is interjecting in the user's life in key areas like grocery stores and restaurants. The analytics should be useful for their present choices and be more of a reminder than anything.

Our last main card is to initiate "Choice Mode." At first, we had split it into "Restaurant Mode" and "Grocery Mode" (Figure J), but we came to realize that these two modes were essentially the same. They both involved helping the user pick between multiple choices and alerting them to ingredients that are unhealthy or even hazardous to their body. Considering all the technology we have at our disposal, it's not too farfetched to say that Google Glass should be able to recognize whether you are shopping for groceries or looking at a menu based on your location or what you are looking at. This will allow the app to work seamlessly into the user's life without them having to switch in between the modes and worrying if they are on the correct one.

With these past three cards being the most important components of our app, we put these screens at the "top" level so they are the most accessible. To get between the cards you swipe left or right because this is the standard way to navigate between cards in Google Glass. Cards like the user profile and settings are deeper in the app, since they are used less frequently.

We decided to extract the user profile into a companion app because inputting lots of information through Google Glass would be difficult. The only feasible solution would be to use voice control, but this also becomes messy (Figures D-F). It is also an issue of privacy. A person's diet and medical issues are sensitive topics and likely not things they would like many people to overhear. By laying it out neatly on a companion app where space isn't as big of an issue, the user can neatly and privately input their dietary preferences and restraints with more familiar forms of adding and removing items (Figure G). This again follows our minimalistic approach of just providing what information is necessary to the user on our app on Google Glass. The user will only look at this screen to verify that their personal preferences are correct.

We also chose to include a settings card so that users can configure the frequency of notifications and automatic of voice control "Choice Mode". We felt that these settings were simple enough to be configured through voice mode.

Functionality

Nutriview's mission is to help people make healthier eating decisions. Everyone's definition of a healthy diet is different, so a big part of Nutriview is allowing the user to customize the app to fit their needs whether they be a body builder who needs a lot of protein, an elderly woman who wants to make sure she gets enough calcium, or someone who was ordered by their doctor to

lower their cholesterol intake. After creating your profile, the application will create a diet plan to suit your restrictions and needs (Figure G & H).

The rest of Nutriview mostly works in the background. It'll automatically keep track of what foods you have eaten and therefore what nutrition you are getting (Figure K). This will allow you to view your nutritional progress throughout the day, and it will bring to your attention any areas you are struggling or exceeding in. You can use this information to reflect and plan for future meals.

Another task that runs silently is "Choice Mode". Choice Mode helps the user pick between various options whether they are at a restaurant or the grocery store (Figure M). It'll alert the user to options that include ingredients they are allergic to or if the item doesn't fit with their meal plan very well. On the flipside, Nutriview will also notify them of particular choices that are really good for them.

Interface Description

Google Glass works by tapping and swiping on a pad near your temple. In general, swiping in Google Glass doesn't result in an action; it is just a way to navigate between cards. We tried to stick to this design to make our application more intuitive to Google Glass users (Figure L). In the reel of all the apps the user possesses, the Nutriview card first appears as the overview screen. The user will tap to open up the app where the overview will expand and show them a pie chart breakdown of the top three nutrition groups they are tracking along with any notifications. From this card, they can swipe right to get to their food log, which simply lists out the foods they have eaten for breakfast, lunch, and dinner. Swiping left now, the user goes to the overview screen again and swipes one more time to the left to arrive at Choice Mode. This activates Choice Mode. It will automatically help the user when it sees that they are trying to make food oriented decisions. Of course the user can turn off the automatic help in Settings and use voice control to achieve the same thing. To turn off Choice Mode at any time, the user just has to swipe away or tap.

Tapping on any of these three cards will bring the user to a new "level" that contains their User Profile and Settings cards. This level also uses left or right swiping to navigate between cards. The User Profile will display their dietary needs and restrictions along with their customized nutrition plan. In the Settings card, it allows users to adjust the amount of notifications they get and control how Choice Mode functions. These are set through voice commands like "Set Choice Mode to automatic" (Figure L: bottom level). To get back to the previous level, the user swipes down, and it'll bring them to whatever card they were last on at that level. Another swipe down and the user will have exited the app.

Scenarios

Configuring User Profile

Jennifer, 28, recently received a Google Glass for Christmas. She's been trying out new applications on her device, and just installed Nutriview because she's interested in improving her

diet so that she can be more healthy. Alice installs Nutreview and views the app's main screen, where she sees a notification asking her set her user profile online. The message says that a link that she can use to set her profile has been sent to her jenny23@gmail.com email address. Jennifer puts her glass into standby mode. She then opens up her gmail account on her computer, finds the email, and clicks the link. She is taken to a web page that asks her to choose a username and password. She chooses a name and password, and presses submit. She then is taken to a page that has various User Profile settings for her to fill in, including her birthdate, gender, height, weight, activity level, diet type, allergies, and dietary restrictions. She enters these fields, and lists "peanuts" under allergens, and "gluten intolerant" under dietary restrictions. She presses save and reopens Nutriview on her Google glass. She sees a notification on the app's main screen that her user profile has been set.

Choosing a Menu Item at a Restaurant

Jennifer is eating lunch out at Green Leaf Vietnamese restaurant with her coworkers. She's been to the restaurant before, and has two main dishes that she always orders, because she knows that they are gluten and peanut free. This is the first time she's visited this restaurant with Google Glass and Nutriview. Jennifer opens up the menu and her glass displays a small Nutriview choice mode icon in the top right corner. As she views the menu, information is projected directly onto the menu she is holding. Several menu items have a transparent overlay over them, along with small text to the side that read "allergen: peanut" and "gluten". Jennifer focuses her attention on all the other items, and is pleasantly surprised that there are a lot more gluten and peanut-free options on this menu than she realized. A few items catch her attention because they have a small green checkmark icon next to them, which she knows means they are healthy options. She chooses the fresh spring rolls, which have the healthy mark, and the grilled pork chop. When she closes the menu, the projected information disappears, and the choice mode icon in the top right corner disappears, indicating to Jennifer that her glass has exited choice mode.

Viewing Nutrition Analytics

On a Saturday afternoon, Jennifer is in the lobby of her Dentist, waiting for her dental appointment. Since she has a little time to spare, Jennifer decides that she's interested in seeing nutrition information about the foods she's eaten today. She opens up Nutriview on her glass, and views the main app screen. She sees a pie chart that shows her how many grams of protein, carbs, and fat she should be eating, with an overlay of the amount of each nutrient she has eaten today. She sees that she only has eaten 10 grams of protein, but that she's supposed to get 50 grams in today. Jennifer decides to make sure to include a decent portion of meat in her dinner tonight. Jennifer also sees that she has eaten 1200 out of the 2000 calories she is expected to eat today. She also sees a few nutrition notifications on the screen, including a notification to get more protein in today, and a notification that she's doing a great job of including vegetables in her diet. The vegetable notification makes Jennifer feel very positive about her diet; she's been intentionally trying to eat more veggies lately. Jennifer closes Nutriview and starts thinking about what she's going to cook for dinner.