Real-Time Carbs Counter

There are many reasons why one would need to calculate the amount of carbohydrates from a serving of food. For example, a diabetic might need to figure out how carbs is on her plate such that the proper insulin dosage can be administered. Another would be a dieter figuring out the proper portion of food on his plate to meet his dietary goals. Carbs estimate is usually simple if the food is singular and uniform (e.g. fries, serving of spinach), but it gets complicated if it's a dish (e.g. beef stew, mixed stir-fry, pizza with toppings.)

Here's the usage scenario: A person has a plate of food in front of her, and she needs to determine the carbs of the food. She activities this "camera-like" application to focus the view on the food just like taking picture using a "photo" app. This application would do the following:

1. Isolate the food from the food container and background,
2. Figure out if the isolated food items match existing entries in its history or local data-base.
3. Estimate the volume of the food
    a. Instruction is for the user to use their hand to grab the container and rotate the container by say 10 degrees. This app would recognize the hand in the frame, scale the food based on the hand size, and estimate the volume from the frames from the different angle views. (We can calibrate the hand size to say a quarter via a calibration screen If we have a way to measure distant then we could use it to triangulate the volume)
4. Calculate the carbs associate with the food
    a. We might need to isolate the food into multiple entries. For example, having different food on a tray would give us multiple results (i.e. one for each food item.)
5. Freeze the image and display the calculated carbs..
    a. Add a border to the item(s) being calculated.
    b. Display the food item(s) that the application thi
    c. There might be multiple carbs entries in that one picture
6. In the event that the item is not matched, there would be a menu to allow the user to define what the food item is such that the application can go to step #3 to evaluate volume and carbs.

Tell us how you plan on bringing it to life.

This project is a concept stage. We have two part-time developers for this project. We plan to open source this project once it is done. We want finer design and code control for the initial release. This allows the

team to learn and keep our own pace. However, we do want to share our frame-work and result with the users such that this application can be useful beyond this one single project.

The plan:

1. December-January. Iron out out all the screens and possible user interactions. Setup automated test such that we can use test-driven development for this project. Ensure we have proper unit test framework for continuous integration. Want to have the design completed and reviewed. (Could use Google's help to review our design. For example, how to isolate the food, the hand, the fixed size quarter, the volume of the food, etc. Could use best practice help from Google on selecting best approach for an android app development that can go from concept to official product release.)
2. February-March. Code the application and tests. (Could use Google's help with reviewing the implemented solution.)
3. March - April. Code the server. Note the server development and test time is overlapped. (Could use Google's help to review best practice for a scalable server solution. There might not have a feed to have a server. Will decide at the design phase)
4. April. Evaluate and refine the product.

Having Google's AI logic in the application would help us on the following:

1. Isolate the "hand" in one of our steps.
2. Isolate the food with some type of edge detection or item isolation scheme
3. Identify the food via some type of pattern matching scheme.
4. Use augmented reality API to display text in real time. (possibly display)

Tell us about you.

I have 20+ years of embedded software development experience for commercial consumer products. I have solely written a simple Android application for a class that I took a few years ago (https://youtu.be/u-eLm8dGd0E). I'm not a complete stranger to Android app development, but I only consider myself as an amatuer Android app developer.

Next steps.

- Be sure to include this cover letter in your GitHub repository
- Your GitHub repository should be tagged #AndroidDevChallenge
- Don’t forget to include other items in your GitHub repository to help us evaluate your submission; you can include prior projects you've worked on, sample code you've already built for this project, or anything else you think could be helpful in evaluating your concept and your ability to build it
- **The final step is to fill out this form to officially submit your proposal.**