Please make a copy of this document and include this in your GitHub repository for your submission, using the tag #AndroidDevChallenge

Tell us what your idea is.

Describe in 250 words what the feature or service will do and how you'll use Machine Learning to push the bar:

Smart FoodLogger:

How many times have you faced the challenge of using an external tool like food weighing scale while logging your calories for the day? What if you could directly log your food intake by just the usage of your phone camera.

In the current fitness world, there are numerous apps, helping the user maintain a daily food journal. Some ask the user to do the entry manually while there are few which detect the object for the user but still depend on an external manual input to get the weight of the food item. How can we try and **eliminate this external weighing scale**, so that the user can log the food item from anywhere automatically.

The Smart Foodlogger App is designed to solve this problem.

The app user can simply point the camera opened in the app to the food item,let's say an apple.

The app would recognise the object(apple), fetch relevant parameters of that object and based on an ML based algorithm will calculate the weight of the object.

Using this weight, the app can show the calorie and macronutrient distribution and advise the user whether eating that food item would be beneficial or not. The train data(of food densities and volumes) along with the user`s validated(validated by the user from the app) train data will help our app`s ML model to predict any weights further along.

Components of the app :

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1. App makes use of CameraX API and onDevice ML for detecting and recognising the food item.

   For a bigger database of food images, covering variety of regions we can use Auto ML with our own train data.

2. Using OpenCV, the app would fetch the necessary parameters to calculate the VOLUME of an object.

3. Based on the Food density charts, the app would query for the DENSITY of the food item, and calculate the estimated WEIGHT of that food item.

4. The app then can show and advice the user, showing the calorie of that food item and percentages of macronutrients, whether to add the food item to their diet or not.

5. Based on this real-time data and the train data as obtained from the user, we can build a model to predict the weight of the food item quickly. We will be using TensorFlow Lite for this.

5. All of these calculations would be in real-time.

Tell us how you plan on bringing it to life.

Describe where your project is, how you could use Google's help in the endeavor, and how you plan on using On-Device ML technology to bring the concept to life. The best submissions have a great idea combined with a concrete path of where you plan on going, which should include:

- *(1) any potential sample code you've already written,*
- *(2) a list of the ways you could use Google's help,*
- *(3) as well as the timeline on how you plan on bringing it to life by May 1, 2020.*

The app concept is in ideation phase currently, going through a PoC for all the components which are required for the app to be feasible to use. The basic app is integrated with Android MLKit(On-Device ML) to detect and recognize the food item.

Phase 1 : a PoC on integrating the app with OpenCV, to fetch parameters like radius, height, width of the object on the basis of the distance from camera and focal length. So as to get the actual(approximate) volume of the object using these parameters.

Phase 2: Design the algorithm to calculate the estimated weight out of this volume, using a trained density chart. The app will also have a mechanism for taking a feedback from the user which will then help our model to learn further. This feedback will compare our estimated weight with the weight the user projects for the app, for our calculated volume of that particular food item. The db collection for the same can be maintained On-Cloud.

Phase 3 : Designing of APIs to fetch the food items macronutrient distribution from the relevant open-source food APIs

How can Google help :

1. *The Food database can be used from Fitbit`s food database.*
2. *In designing the pre-trained model of an estimated weight from parameters like radius, food type, height, width, volume, density etc.*

Tell us about you.

A great idea is just one part of the equation; we also want to learn a bit more about you. Share with us some of your other projects so we can get an idea of how we can assist you with your project.

I am an Android developer by profession, currently working on enterprise level Android SDK`s and applications for **Oracle Marketing Cloud - Responsys**. I have 7 years of experience in this field, so have actually learned and grown through each Android release by Google.

I would consider myself a Newbie in the Machine Learning field, and have a cool project of a **Neural Network base Lie Detector** built using Matlab and Coleo tools.

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.**