Calorie Intake Detection and Guide to Food

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Introduction

Modern times have made it necessary that people keep track of their diet plans for observing how much calorie they consume everyday. It helps in taking decisions what type of food is beneficiary and which one should be avoided. Such information about diet helps living a healthy life and thus affects every aspect of life. This is because a good physical health has always a positive effect on other aspects of life. The problem in achieving a good physical health with the help from nutritional info is that it is not handy when needed. It is uncommon that what we eat daily is having nutritional info right together with it. This project gives solution to this problem.

This solution is based on an Android application. This Android application makes use of some clever tools and technologies developed recently. The main functionality of the application is detecting calorie information from food item captured in the image. It prompts user to capture an image of food item and informs user about calorie intake right after capturing image. It is also possible to load an image from already captured images.

Scope

The application can be very helpful to anyone willing to take help of calorie intake information for accomplishing health goals. To solve the problem related to health, this smartphone application is chosen because smartphone usage is widespread across the world. For anyone out there willing to track calorie intake, it would be very convenient to use this smartphone application in doing so. The application provides useful information about how much daily calorie intake is recommended for if user provides information like gender, age group and type of lifestyle etc. User can use this daily recommended calorie intake guide to achieve health goals. It also provides information of various sources for vital nutrients. For example, a user may be interested in protein intake. It is available in soy, dairy and nuts etc.

With time many other features may be also made available. For example, based on user history food items can be recommended.

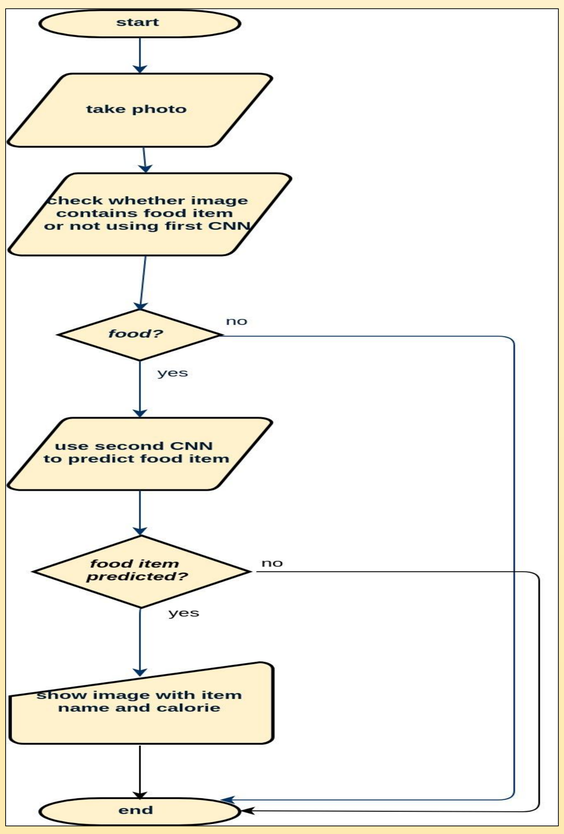
Methods

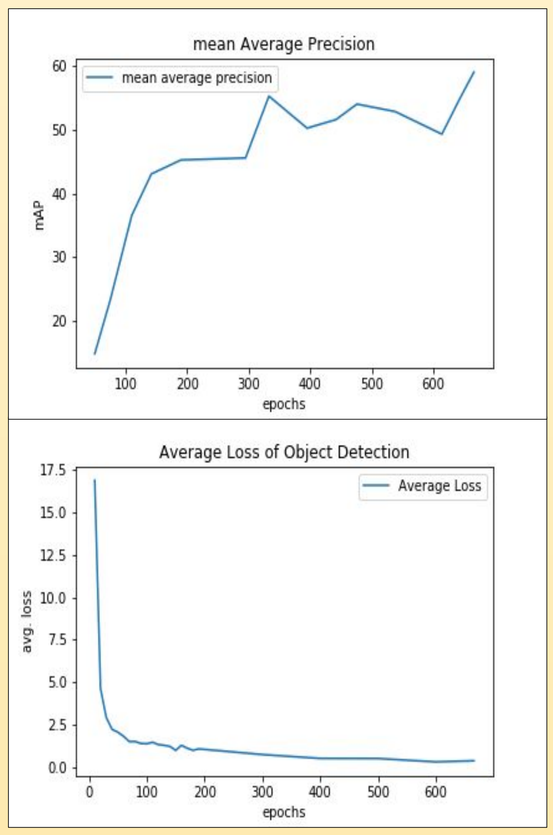
The first step of our project is to confirm that the image contains food item. For that, we built first Convolutional Neural Network using TFlearn library which only allows those image to be passed to the second stage which have at least one food item. The accuracy of this CNN is 92.37%. Once, this is done, the image will be given to second Convolutional Neural Network which is YOLO, You Only Look Once. YOLO is one of the best real time object detection models available which detects objects in an image in just one pass.

YOLO is built in C language and implemented in Python. This makes it super fast and different from other models. We used tiny version on YOLOv3. We got 59.05% mAP, mean Average Precision and 53.46% average IOU, Intersection Over Union. The accuracy of predicting object ranges between 70% to 95%.

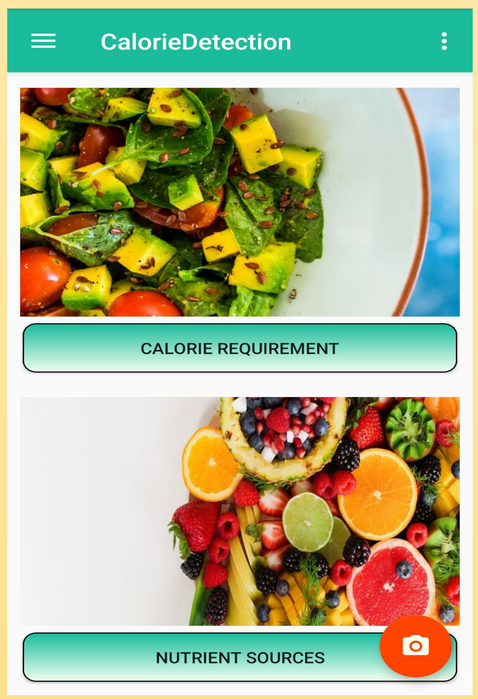
Now, that food item is detected from an image, using our database we give the calories of that particular food item.

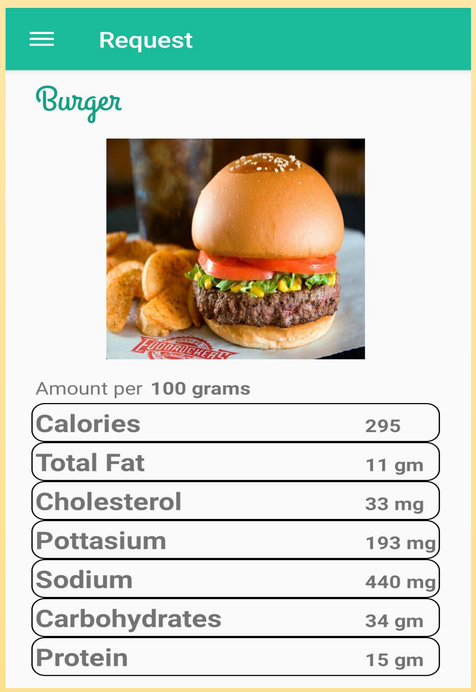
Flowchart





Results





Conclusions

This application enables user to make informed decisions with the help from recently developed tools of technologies. A smartphone application can really benefit a lot from advance technologies and can perform complicated tasks much easily.

Bibliography

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