Project ReFEED: Nutrition tracker

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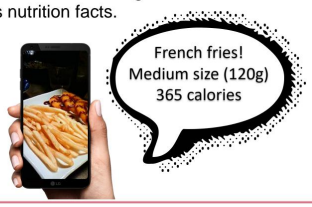
Introduction

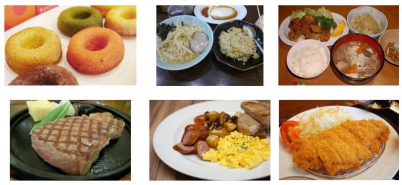
The advent of technology has taken big steps in healthcare areas over the past decade. People now have more means and ease to monitor their health conditions. Yet it is still very difficult to get accurate information of the nutrition from our everyday meals. It is the goal of this project to tackle this barrier with a computer vision system that leverages the camera and computing power in a smartphone to quickly identify the type of food from a camera image and inform the user about its nutrition facts.



Dataset

Open Food Facts
https://www.kaggle.com/openfoodfacts/world-food-facts
The dataset "Open Food Facts" contains nutrition facts from foods around the world

UEC Food 256
http://foodcam.mobi/dataset256.html
The dataset "UEC FOOD 256" contains a total of 31395 food photos in 256 categories. Each food photo has a bounding box indicating the location of the food item in the photo.



Inception model

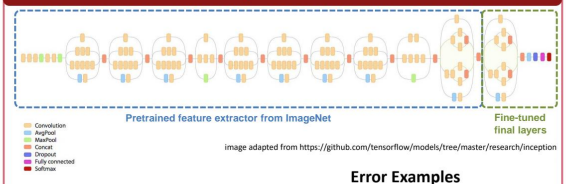
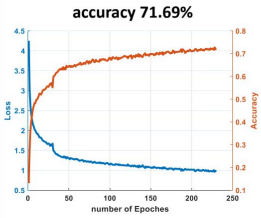
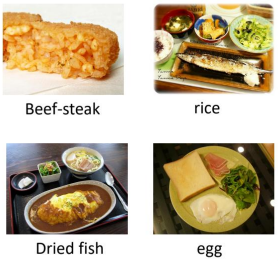


image adapted from https://github.com/tensorflow/models/tree/master/research/inception

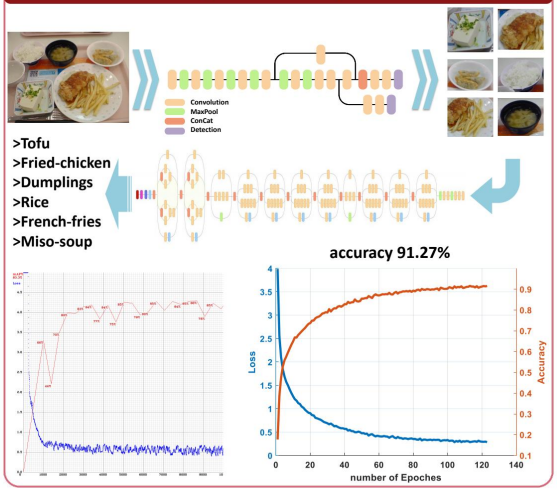


Error Examples



YOLO model

Tiny YOLO + Inception

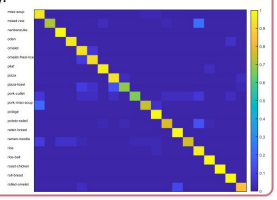


Conclusion and future steps

This study investigates and compares the performances of several different convolutional neural network architectures. After error analysis, a hybrid system that uses a small YOLO food identifier and an InceptionV3 feature extractor to achieve the best accuracy.

Future steps:

- More labeled data
- More categories
- Custom anchor boxes



References

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3. YOLO for Real-Time Food Detection. (n.d.). Retrieved June 6, 2019, from http://bennycheung.github.io/yolo-for-real-time-food-detection