AI-powered Nutrition Analyzer for Fitness Enthusiasts

TEAM ID: PNT2022TMID05625

TEAM LEADER: JASWANTH SOLAI V.N (1901058)

TEAM MEMBER: AMRIT S (1901009)

ARJUN T (1901017)

DHANANJAY SIVAJI (1901032)

About:

Nutrition is a critical part of health and development. Better nutrition is related to improved infant, child and maternal health, stronger immune systems, safer pregnancy and childbirth and longevity. Nutritional analysis ensures that the food has optimal requirements of vitamins and minerals where the examination of nutrition in food helps in understanding the proportion of fat, carbohydrate dilution, protein, fibre, sugar, etc. Another thing we must take care not to exceed the daily calorie needs. If we fall behind, we may end up obese.

Literature Review

Paper / Title	Author	Yeat	Objective	Proposed Technique	Limitations/ Improvements
DeepFood: Deep Learning-Based Food Image Recognition for Computer-Aided Dietary Assessment	Chang Liu, Yu Cao, Yan Luo, Guanling Chen, Vinod Vokkarane, and Yunsheng Ma	2016	To propose a new CNN architecture for food image recognition and apply benchmark on UEC-256 and Food-101	A new architecture was proposed based on the backbones of LeNet, AlexNet and GoogleNet. After convolutions, it was followed by sub-sampling to reduce dimensions and FC layers.	The inference time is extremely long for even a single image and hence not feasible to deploy in real time
An Image Analysis System For Dietary Assessment And Evaluation	Fengqing Zhu, Marc Bosch, Carol J. Boushey and Edward J. Delp	2011	To use a mobile device with a built-in camera, network connectivity, integrated image analysis and visualization tools, and a nutrient database, to allow a user to easily record foods eaten. Images acquired before and after foods are eaten can be used to estimate the amount of food consumed.	1) Image Segmentation 2) Classification using SVM 3) Volume Estimation with the help of Camera Calibration	Not be able to recognize every food or differentiate between similar looking foods.
Food Image Analysis And Dietary Assessment Via Deep Model	Landu Jiang	2020	To design and implement a system for food image analysis - output the amount of nutritional ingredients of each food items from daily captured	Extract the regions of interests (ROIs) by applying the Region Proposal Network	To provide a healthy diet, an automatic diet calculator.

			images. A thorough dietary assessment report will be generated based on what you have during the meal.	derived from the Faster R-CNN model. Apply Convolutional Neural Network (CNN) on selected RoIs and classify them into different food item categories. A regression module is also used to locate the food coordinates in the image.	
Deep-Learning Assisted Multi-Dish Food Recognition Application For DIietary Intake Reporting	Ying-Chieh Liu	2022	To integrate ML innovations of a realistic mobile health application using mobile ICT and AI technology to allow people to report their dietary intake easily and accurately under real conditions.	Adopted EfficientDet-D1 with EfficientNet-B1 as the backbone. EfficientDet detector architecture with EfficientNet was selected	Yet to be integrated with a mobile app or web application.