**AI-powered Nutrition Analyzer for Fitness Enthusiasts**

**Literature Review – Pranav R R**

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| Paper / Title | Author | Year | Journal | Objective | Proposed Technique | Limitations/  Improvements |
| AN IMAGE ANALYSIS SYSTEM FOR DIETARY ASSESSMENT AND EVALUATION | Fengqing Zhu, Marc Bosch, Carol J. Boushey and Edward J. Delp | 2011 | NCBI | 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. |
| EVIDENCE-BASED DEVELOPMENT OF A MOBILE TELEPHONE FOOD RECORD | Bethany L Six, TusaRebecca E Schap, Anand Mariappan, | 2011 | NCBI | (1) to test whether participants' proficiency with the mpFR improved after training and repeated use, and (2) to measure changes in perceptions regarding use of the mpFR after training and repeated use. | 1. Image Segmentation 2. Volume Estimation 3. FNDDS Indexing Nutrient Info | Needs to accommodate the lifestyles of its users to ensure useful images and continuous use throughout the day or multiple days. |
| AUTOMATIC FRUIT RECOGNITION: A SURVEY AND NEW RESULTS USING RANGE/ATTENUATION IMAGES | Jimenez A, Jain A, Ceres R, Pons J. | 1999 | Science Direct | To recognize spherical fruits in different situations such as shadows, bright areas, occlusions and overlapping fruits. | Two images represent the azimuth and elevation angles the attenuation is in *ATTE*(*x, y*) and the reflectance image *REFL*(*x, y*). The image analysis process uses the images obtained from the scanner to detect the position of the fruits by thresholding and clustering. | Cannot work with low resolution images. |
| FOOD IMAGE ANALYSIS AND  DIETARY ASSESSMENT VIA DEEP MODEL | Landu Jiang | 2020 | Research  Gate | To design and implement a system for food image  analysis - output the amount of nutritional ingredients of each food items from daily captured images. A thorough  dietary assessment report will be generated based on what you have during the meal. | Extract the regions of interests (ROIs) by ap-  plying the Region Proposal Network 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. | To provide a healthy diet,  an automatic diet calculator. |
| DEEP-LEARNING-ASSISTED MULTI-DISH FOOD RECOGNITION APPLICATION FOR DIETARY INTAKE REPORTING | Ying-Chieh Liu | 2022 | Research  Gate | 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. |