Nutrition Assistant Application

Introduction

One of the new concerns in human life is health and wellness. Health and nutrition are undeniably important aspects of life. Thus, technological advancements to improve and even promote health awareness are critical. Many mobile applications are being developed to help with health monitoring and nutritional guidance. Nowadays, one of the primary goals of health research is dietary awareness ie. to encourage an organized approach to food nutrition monitoring. App-based nutrient dashboard systems can analyze real-time images of a meal and analyze it for nutritional content which can be very handy and improves dietary habits, and therefore, helps in maintaining a healthy lifestyle.

Literature Review

[1] **NutriTrack: Android-based food recognition app for nutrition awareness**

The researcher developed an Android-based food recognition application used as a health awarenesss by allowing the user to photograph food and view its nutritional content. Users are informed of their required calorie intake when the system implements the Mifflin-St Jeor method to determine daily calorie consumption. Furthermore, the researchers investigated its impact on people's health awareness regarding food nutrition using randomly selected respondents. Finally, this paper examines the impact of the food recognition app on changing people's perceptions of food nutrition.

Advantages: Clarifai and Nutritionix deliver precise outcomes in regards to food detection and nutrition calculation based on user's analysis. Features of the application resemble the user requirements that address the problem of dietary monitoring.

Disadvantages: The study shows that respondents' level of food nutritional awareness is remarkably low as to the status of cognizance about food intake. The framework utilized in the development of the application greatly influenced the usability and functionality of the application

[2] **Using Deep Learning for Food and Beverage Image Recognition**

NutriNet, a novel deep learning architecture, and a pixel-level classification solution for images of fake food were created by the researchers. NutriNet was

the first to recognise beverage images after being trained on a larger food image dataset with more food classes than previous works. Their work on fake-food image recognition includes the development of the first automatic system for recognizing images of fake food, and the visual similarity between fake and real food makes it useful for both fake-food experiments and real food recognition.

Advantages: They presented a solution for pixel-level classification of food images using deep learning. They used the FCN-8s food images and achieved a high classification accuracy.

Disadvantages: The deep learning wasn't implemented inside a practical solution space like dietary assessment, which would benefit the general population.

[3] **Auto-recognition of food images using SPIN feature for Food-Log system**

In this paper, a food-log system is constructed, which can auto-recognize the menu contents from food image that contains several types of foods, and give detailed nutrient and some advice for improving the dietary life. Rotation invariant features using circle-segmentation called SPIN for food recognition are extracted from each segmented food region. The auto-recognition of food can achieve about 78% recognition precision by multi-class SVM.

Advantages: The experiment showed that the proposed SPIN feature can achieve the best accuracy rate than the global one and the local regular-grid one for dish recognition.

Disadvantages: In future work, it prospects to improve segmentation of dish region. The proposed algorithm can be modified further.

[4] **Picture-to-Amount (PITA): Predicting Relative Ingredient Amounts from Food Images**

PITA, a deep learning architecture for predicting the relative amount of each ingredient in a given food image, was proposed. From a domain-driven Wasserstein loss from image-to-recipe cross-modal retrieval system, they first learn an image embedding representation. Then, using an amount prediction network, they detect ingredients from ingredient detection networks and predict amounts based on the results of the ingredient detection networks. As part of the

evaluation metric and loss function, ingredient substitution groups are created to facilitate functional ingredient substitutions.

Advantages: Their method generates state-of-the-art results, improving previous baselines, even in the presence of challenging test examples, the model is still able to yield robust ingredient amount estimates.

Disadvantages: In future work, it prospects to improve classification accuracy.

References:

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[4] J. Li, F. Han, R. Guerrero and V. Pavlovic, "Picture-to-Amount (PITA): Predicting Relative Ingredient Amounts from Food Images," 2020 25th International Conference on Pattern Recognition (ICPR), 2021, pp. 10343-10350, doi: 10.1109/ICPR48806.2021.9412828.