Literature Review

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Team ID	B4-4M6E
Project Name	Nutrition assistant Application

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.

Smart Log system that performs automated nutrition monitoring and meal prediction.

The smart sensor board consisting of Piezo Electric sensors is used for nutrition quantification. The nutrient data acquisition is done using Optical Character Recognition and by linking open source Application Program Interfaces (APIs) through barcodes. The meal prediction is done by collecting nutritional value of the leftover food along with the user's feedback on the type of food that is desired. The SR8 database available through the US Department of Agriculture website is also analysed using their API which provides a food report of associated nutrient values for a particular food item and a nutrient report which gives an extensive list of food and their nutrient

values for a selected amount of nutrients. The results have been analysed by creating an AttributeRelation File Format which inputs the Waikato Environment for Knowledge Analysis (WEKA) tool which builds a better prediction model and is observed that the Bayesian classifiers provided better results.

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.