LITERATURE SURVEY

Project Title: "AI- Powered Nutrition Analyzer
for Fitness Enthusiasts"

TEAM ID : PNT2022TMID30778

Team Leader : M.KOKILAVANI
Team Member : G.KEERTHIKA
Team Member : T.GAYATHIRI
Team Member : M.KARTHIKA

1.Paper title	"Approximate Estimation of the Nutritions of Consumed Food by Deep Learning" by İbrahim Berkan Aydilek Published in 2017 International Conference on Computer Science and Engineering (UBMK), IEEE, 2017.
Problem definition	• Controlled intake of nutrition is recommended as a condition for being a healthy individual. Knowing and monitoring how much food is consumed during the day, following the calorie and nutrition of these foods helps to control healthy nutrition. • In this study, an attempt was made to approximate the nutrition of the food at the image level using the Food-pictures dataset that contain nutrient images.
Methodology/ Algorithm	• Convolutional Neural Network (CNN) • Artificial Intelligence • Deep Neural Network • Image Classification
Advantages	• Convolutional Neural Networks (CNN), a deep learning approach that has been used successfully in image recognition and classification tasks, has been trained with nutrition image training data. • A high classification success value has been achieved.
Disadvantages	• It is extremely expensive to train due to complex data models. • Moreover deep learning requires expensive GUIs and hundreds of machines. This increases the cost to the users.

2. PAPER TITLE	"Validation of a deep learning system for the full automation of bite and meal duration analysis of experimental meal videos" D Konstantinidis, K Di Mitropoulos, B Longleat,Padas… - Nutrients, 2020
PROBLEM DEFINITION	Eating behavior can have an important effect on, and be correlated with, obesity and eating disorders. To remedy the latter a novel "Rapid Automatic Bite Detection" (RABiD) algorithm that extracts and processes skeletal features from videos was trained in a video meal dataset (59 individuals; 85 meals; three different foods) to automatically measure meal duration
METHODOLOGY/ ALGORITHM	Deep learning LSTM – long Short Term Memory Convolutional Neural Network(CNN) Max Pooling
ADVANTAGES	On a methodological level, RABiD offers a valid, fully automatic alternative to human meal-video annotations for the experimental analysis of human eating behavior, at a fraction of the cost and the required time, without any loss of information and data fidelity Self-rated methodologies, which are predominantly used for estimating eating behavior, being cost effective and easy to analyze, rely heavily on the participant's input
DISADVANTAGES	This methodology is still limited [15] by its dependency on time-consuming and error-prone manual video annotations, with many studies resorting to the use of multiple human annotators. Often suffers from reliability issues.

3.PAPER TITLE	"Precision Nutrient Management Using Artificial Intelligence Based on Digital Data Collection Framework" by Hsiu-An Lee, Tzu-Ting Huang, Lo-Hsien Yen, Pin-Hua Wu, Kuan-Wen Chen, Hsin-Hua Kung, Chen-Yi Liu and Chien-Yeh Hsu Appl.Sci.2022,12,4167. https://doi.org/10.3390/app12094167
PROBLEM DEFINITION	Nutritional intake is fundamental to human growth and health, and the intake of different types of nutrients and micronutrients can affect health. The content of the diet affects the occurrence of disease, with the incidence of many diseases increasing each year while the age group at which they occur is gradually decreasing. To solve this problem an artificial intelligence model is used for precision nutritional analysis allows the user to enter the name and serving size of a dish to assess a total of 24 nutrients.
METHODOLOGY /ALGORITHM	A total of two AI models, including "Semantic analysis model" and "Nutritional analysis models", were integrated into the Precision Nutritional Analysis. A total of Five different algorithms were used to identify the most similar recipes and to determine differences in text using cosine similarity.
ADVANTAGES	This study proposed an Intelligence Precision Nutrient Analysis Model based on a digital data collection framework, where the nutrient intake was analyzed by entering dietary recall data. The AI model can be used as a reference for nutrition surveys and personal nutrition analysis. The AI Precision Nutrient Analysis Model was used to analyze the ingredients of the dishes and calculate nutrient intake by automatically analyzing the dishes, and portion sizes were analyzed using a digital data semantic analysis model.
DISADVANTAGES	It is extremely expensive due to semantics analysis model and nutritional analysis model.

4.PAPER TITLE	"AI Nutrition Recommender System" by Thamos Theodoridis, Vassilios Solachidis, Kosmos Dimitropoulos, Lazaros Gymnopoulos and Petros Daras in the 12th Pervasive Technologies Related to Assistive Environments Conference
PROBLEM DEFINITION	The consumption of a wide variety of food items is necessary in order for the human body to obtain the right amounts of nutrients. Failing to follow such a well-balanced diet, in combination with a generally unhealthy way of living, has been shown to increase the risk for cardiovascular disease, type II diabetes and some forms of cancer. Taking all these factors into consideration, food intake monitoring can provide substantial benefits in certain cases.
METHODOLOGY/ ALGORITHM	Machine learning Food category Recogniser Object Vision Convolutional Neural Network(CNN) Computer Vision Information Retrieval
ADVANTAGES	AI and its various subsets have been leveraged by these platforms to identify the calorie intake and also to make food recommendations for a healthy diet. In most cases, what we see is that these platforms act as a data repository where while providing real-time information to its users, it also makes available to numerous clients who work in this field for a determined rate.
DISADVANTAGES	In order to make recommendations, the system needs to collect nutritional needs from users. Most of the information is only provided through continuous interactions with users. However, in reality, recording nutritional intake from users cannot avoid faults because users usually forget or give wrong information about the foods they have consumed .