IBM – NAALAYA THIRAN

AI-POWERED NUTRITION ANALYZER FOR FITNESS ENTHUSIASTS

LITERATURE SURVEY

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1.Artificial Intelligence in Nutrients Science Research

Authors: Jaroslaw Sak and Magdalena Suchodolska

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7911928/

In the area of biomedical nutrients research, there were identified studies in which advanced AI methods and systems were applied in relation to the study of the composition of food products, optimization of nutrient production, the effects of nutrients on the functioning of the human body in health and disease and research on the gut microbiota. According to graphical characteristics of the analyzed works, the ANN methodology dominated both in food composition study and the production of nutrients. Among the works on the influence of nutrients on the functioning of the human body in health and disease and studies on the gut microbiota, ML domain algorithms were used almost exclusively. The fuzzy logic methodology was used occasionally.

2.A new Deep Learning-based Food Recognition System for Dietary Assessment

Authors: Chang Liu,Yu Cao,Senior Member,IEEE,Yan Luo

https://ieeexplore.ieee.org/ielaam/4629386/8332642/7837725-aam.pdf

Literature has indicated that accurate dietary assessment is very important for assessing the effectiveness of weight loss interventions. However, most of the existing dietary assessment methods rely on memory. With the help of pervasive mobile devices and rich cloud services, it is now possible to develop new computer-aided food recognition system for accurate dietary assessment. However, enabling this future Internet of Things-based dietary assessment imposes several fundamental challenges on algorithm development and system design. In this paper, we set to address these issues from the following two aspects: (1) to develop novel deep learning-based visual food recognition algorithms to achieve the best-in-class recognition accuracy; (2) to design a food recognition system employing edge computing-based service computing paradigm to overcome some inherent problems of traditional mobile cloud

computing paradigm, such as unacceptable system latency and low battery life of mobile devices.

3. Analyzing Description, User Understanding and Expectations of AI in Mobile Health Applications

Authors:Zhaoyuan su,BS,Mayara Costa Figueiredo

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8075490/

Mobile health apps help healthcare consumers, such as patients and caregivers, or even healthy individuals, to monitor and track their health data daily. Prior studies showed mobile health apps could assist consumers in managing their health and making various decisions regarding their health.Among all the mobile health apps, an increasing number of them are described as using Artificial Intelligence (AI) algorithms. For example, the Natural Cycles App describes using AI algorithms to predict a user's fertility window assisting fertility care, Woebot app uses conversational agent (a subset of AI) to chat with users and deliver Cognitive Behavior Therapy to help them fight depression and the Ada app describes using AI to diagnose users' potential medical conditions. These apps bring AI algorithms to technologies directed to healthcare consumers, who have different levels of technology and health literacy, and may make daily decisions or perform daily activities based on algorithmic outputs.

4. Smartphone Apps for Tracking Food Consumption and Recommendations: Evaluating Artificial Intelligence-based Functionalities, Features and Quality of Current Apps

Authors: Sabiha Samad, Fahmida Ahmed

https://www.researchgate.net/publication/362265371_Smartphone_Apps_for_Tracking_Food_Consumption_and_Recommendations_Evaluating_Artificial_Intelligence-based_Functionalities_Features_and_Quality_of_Current_Apps

The advancement of artificial intelligence (AI) and the significant growth in the use of food consumption tracking and recommendation-related apps in the

app stores have created a need for an evaluation system, as minimal information is available about the evidence-based quality and technological advancement of these apps. Electronic searches were conducted across three major app stores and the selected apps were evaluated by three independent raters. A total of 473 apps were found and 80 of them were selected for review based on inclusion and exclusion criteria. An app rating tool is devised to evaluate the selected apps. Our rating tool assesses the apps' essential features, AI based advanced functionalities and software quality characteristics required for food consumption tracking and recommendations, as well as their usefulness to general users

5. Precision Nutrient Management Using Artificial Intelligence Based on Digital Data Collection Framework

Authors: Neil Yuwen Yen, Chen-Kun Tsung, Vinod Kumar Verma and Chao-Tung Yang

https://www.mdpi.com/2076-3417/12/9/4167

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. (2) Methods: An artificial intelligence model for precision nutritional analysis allows the user to enter the name and serving size of a dish to assess a total of 24 nutrients. A total of two AI models, including semantic 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. (3) Results: This study developed two models to form a precision nutrient analysis model. The 2013–2016 Taiwan National Nutrition Health Status Change Survey (NNHS) was used for model verification. The model's accuracy was determined by comparing the results of the model with the NNHS. The results show that the AI model has very little error and can significantly improve the efficiency of the analysis. (4) Conclusions: 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.