AI-POWERED NUTRITION ANALYZER FOR FITNESS ENTHUSIASTS

AUTHOR : Jaroslaw Sak and Magdalena Suchodolska

YEAR : 2021

ABSTRACT: Artificial intelligence (AI) as a branch of computer science, the purpose of which is to imitate thought processes, learning abilities and knowledge management, finds more and more applications in experimental and clinical medicine. In recent decades, there has been an expansion of AI applications in biomedical sciences. The possibilities of artificial intelligence in the field of medical diagnostics, risk prediction and support of therapeutic techniques are growing rapidly. The aim of the article is to analyze the current use of AI in nutrients science research. The literature review was conducted in PubMed. AI in biomedical nutrients research (20 studies), AI in clinical nutrients research (22 studies) and AI in nutritional epidemiology (13 studies). It was found that the artificial neural network (ANN) methodology was dominant in the group of research on food composition study and production of nutrients. However, machine learning (ML) algorithms were widely used in studies on the influence of nutrients on the functioning of the human body in health and disease and in studies on the gut microbiota. Deep learning (DL) algorithms prevailed in a group of research works on clinical nutrients intake. The development of dietary systems using AI technology may lead to the creation of a global network

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

YEAR: 2021

ABSTRACT: 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. We have conducted extensive experiments with real-world data. Our results have shown that the proposed system achieved three objectives: (1) outperforming existing work in terms of food recognition accuracy; (2) reducing response time that is equivalent to the minimum of the existing approaches; and (3) lowering energy consumption which is close to the minimum of the state-of-the-art.

AUTHOR:Katherine M. Phillips & Wayne R. Wolf &Kristine Y. Patterson & Katherine E. Sharpless &Joanne M. Holden

YEAR:2007

ABSTRACT:Over a 6.5-year period a total of 2554 values were reported by nine laboratories for 259 certified or reference nutrient concentrations in 26 certified reference materials (CRM) submitted to contract laboratories, blinded, as part of the qualifying process for analytical contracts and in the routine sample stream as part of theNational Food and Nutrient Analysis Program. Each value was converted to a Z′-score, reflecting the difference from the assigned value related to the combined expected analytical uncertainty plus the uncertainty in the CRM value. Z′-scores >|3.0| were considered unacceptable. For some nutrients (Na, folate, dietary fiber, pantothenic acid,thiamin, tocopherols, carotenoids, monounsaturated, and polyunsaturated fatty acids), >20% of Z′-scores were >|3.0|.For total fat, vitamin C, and niacin >25% of Z′-scores were>|2.0|. Components for which CRM data were best (more than 90% of Z′-scores <|2.0|) were Mg, P, Mn, Se, and vitamin B12. For Na almost all high Z′-scores were for low-Na matrices,suggesting analytical problems related to concentration

AUTHOR: Eileen R Gibney

YEAR: 2019

ABSTRACT :Dietary assessment methods are important tools for nutrition research. Online dietary assessment tools have the potential to become invaluable methods of assessing dietary intake because, compared with traditional methods, they have many advantages including the automatic storage of input data and the immediate generation of nutritional outputs.The aim of this study was to develop an online food frequency questionnaire (FFQ) for dietary data collection in the "Food4Me" study and to compare this with the validated European Prospective Investigation of Cancer (EPIC) Norfolk printed FFQ.The Food4Me FFQ used in this analysis was developed to consist of 157 food items. Standardized color photographs were incorporated in the development of the Food4Me FFQ to facilitate accurate quantification of the portion size of each food item. Participants were recruited in two centers and each received the online Food4Me FFQ and the printed EPIC-Norfolk FFQ in random order. Participants completed the Food4Me FFO online and, for most food items, participants were requested to choose their usual serving size among seven possibilities from a range of portion size pictures. The level of agreement between the two methods was evaluated for both nutrient and food group intakes using the Bland and Altman method and classification into quartiles of daily intake. Correlations were calculated for nutrient and food group intakes.

AUTHOR: Raza Unus,Omar Arif

YEAR: 2017

ABSTRACT:There has been a rapid increase in dietary ailments during last few decades, caused by unhealthy food routine. Mobile-based dietary assessment systems that can record real time images of meal and analyze it for nutritional content can be very handy and improve the dietary habits, and therefore, result in healthy lite. This paper proposes a novel system to automatically estimate food attributes such as ingredients and nutritional value by classifying the input image of food. Our method employs different deep learning models for accurate food identification. In addition to image analysis, attributes and ingredients are estimated by extracting semantically related words from a huge corpus of text, collected over the Internet.We performed experiments with a dataset comprising 100 classes, averaging 1000 images for each class to acquire top 1 classification rate of up to 85 percent. An extension of a benchmark dataset Food-101 is also created to include sub-continental foods. Results show that our proposed system is equally efficient on basic Food-101 dataset and its extension for sub-continental foods. The proposed system is implemented