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# LITERATURE SURVEY OF AI-POWERED NUTRITION ANALYZER FOR FITNESS ENTHUSIASTS

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**Paper Title:** Adaptive data processing for real-time nutrition monitoring

**Author(s):** Anahita Hosseini, Haik Kalantarian, Majid Sarrafzadeh

**Published on:** 2016

# Abstract:

# The split of continuous sensor data into discrete windows, each of which is analysed separately and given a class label, is known as time-series segmentation. Segmentation for low-power wearable devices must strike a compromise between the conflicting goals of accuracy and computing economy, in contrast to offline data processing situations. In this study, using an adjustable window size technique, a unique method is used for segmenting sparse sensor data. In comparison to the baseline with constant window widths, the results are, which are benchmarked on an audio-based nutrition monitoring dataset, indicate a processing overhead reduction of 68%.

# Due to their evolving lifestyles, some people have a tendency to put food down after they have finished eating. Food left unattended wastes the nutrients that individuals have absorbed into their bodies. Understanding the amount of nutritional loss helps identify the variables that affect food leftovers, which reduces the amount of food wasted. In this article, a technique is used for estimating the nutritional value of leftovers using food photos from a single tray box and an image processing algorithm. Smart Nutrition Box prototype also has this functionality (SNB). To estimate the weight of food images placed in the tray box, the Automatic Food Leftover Estimation (AFLE) method is used.

**Paper Title:** A New Deep Learning-based Food Recognition System for Dietary Assessment on an Edge Computing Service Infrastructure

**Author(s):** Chang Liu, Yu Cao, Guanling Chen, Vinod Vokkarane, Yunsheng Ma, Songqing Chen, Peng Hou

**Published on:** 2017

# Abstract:

According to the literature, a precise dietary evaluation is crucial for determining how effective weight reduction therapies are. However, the majority of the nutritional evaluation techniques in use today rely on memory. A novel computer-aided food recognition system for precise dietary evaluation is now achievable thanks to widespread mobile devices and extensive cloud services. For algorithm development and system design, however, implementing this Internet of Things-based nutritional evaluation raises a number of basic obstacles. The address of these concerns is set out from the following two perspectives in this paper: (1) to create revolutionary deep learning-based visual food identification systems that have the highest recognition precision possible; (2) create a system for food identification using edge computing-based service computing to get around some of the fundamental issues with standard mobile cloud computing, such excessive system latency and short battery life of mobile devices. This paper demonstrates that the suggested system accomplished three goals: (1) outperforming previous work in terms of food recognition accuracy; (2) cutting response time to a level that is equivalent to that of existing approaches; and (3) reducing energy consumption to a level that is close to that of the state-of-the-art.

**Paper Title:** Predicting food nutrition facts using pocket-size near-infrared sensor

**Author(s):** Yoke Jia Thong, Thuong Nguyen, Qing Zhang, Mohan Karunanithi, Lei Yu

**Published on:** 2017

# Abstract:

# One of the most crucial components of preventative healthcare, which tries to lower various health risks, is diet monitoring. All systems have included manual recording, but it is time-consuming and frequently results in low adherence rates. Accuracy, effectiveness, and user acceptance rate are issues with several currently used strategies for monitoring food consumption. This research proposes a unique method for determining food nutrition facts using a portable, non-intrusive near-infrared (NIR) scanner. Effective regression models that can quantitatively estimate the energy and carbohydrate content of meals have been developed. These comprehensive tests on commercially available liquid foods show how accurate these regression models are and show how they can be used to estimate food nutrition using NIR spectra obtained with a tiny handheld scanner. One of the primary causes of the increasing incidence of metabolic illnesses like obesity and diabetes is due to this. As a result, in recent years, research interest in monitoring nutritional levels of food consumption has increased.

**Paper Title:** Advancing Artificial Intelligence in Health Settings Outside the Hospital and Clinic

**Author(s):** Akul Aggarwal, Mahnoor Ahmed, Sanjay Basu, John J. Curtin, Barbara J. Evans, Michael E. Matheny, Shantanu Nundy, Mark P. Sendak, Carmel Shachar, Rashmee U. Shah, and Sonoo Thadaney-Israni

**Published on:** 2020

# Abstract:

Artificial intelligence (AI)-driven products and technology are proliferating in the health care ecosystem, with the potential to improve care delivery outside of hospital and clinic settings. These techniques can be used for telehealth visits, remote monitoring, or to focus on high-risk groups for more extensive medical interventions. These tools can be of great help in facilitating patients' convenient access to their provider teams, facilitating providers' comprehension of their patients' daily routines, extending care access to underserved communities, and providing individualized, real-time care in the patient's home environment because most patients spend much of their time outside of a hospital or a doctor's office. More importantly, since most of these tools are designed to assist patients in changing their own behavior or to facilitate two-way communication between patients and clinicians for more individualized care, expanding care to new settings (such as the home or office) could empower patients and caregivers. These venues are referred to by the authors of this publication as "health settings outside the hospital and clinic," or HSOHC (pronounced "h-sock"). When it comes to providing continued care in the face of the disturbances brought on by the COVID-19 epidemic, these instruments' capabilities are sometimes proving to be incredibly opportune.

**Paper Title:** A Computer Vision-based Indian Food Detection and Nutrition Calculation App

**Author(s):** Durgesh Samariya

**Published on:** 2022

# Abstract:

A number of regional traditional cuisines make up Indian cuisine. These cuisines differ greatly and utilise ingredients that may be found nearby due to the diversity of the land, climate, culture, ethnic groups, and vocations. A little over 1.4 billion people live in 36 states and union territories, each with their own distinctive cuisine and history. People today are more concerned about their health than ever before. However, there is a shortage of information on several food-related elements of wellness and fitness. As a result, Foodify.ai is created, a deep learning-based software that recognises food in images and delivers details about the item, including its protein, vitamin, calorie, mineral, and carbohydrate content.

The deep learning community does not have access to any such public dataset or application in the context of Indian food. In order to fill this research gap, The Foodify.ai is created. This app's objective is: The largest Indian food picture dataset in the world and an app that recognises Indian cuisine and offers dietary statistics.

Stages of application is: Image Collection Application, Train Deep Learning Model and Develop Prototype Application, Create a nutrition Database and Develop Mobile App.