LITERATURESURVEY

NUTRITION ASSISTANT APPLICATION

CLOUD APPLICATION DEVELOPMENT

TEAM NAME: TEAM ICONIC

TEAM MEMBERS NAME:

1. NANDHINI M
2. NITHYA SRI V
3. PAVITHRADEVI S
4. PREETHI L

PAPER:1

TITLE: Personalized Dietary Assistant - An Intelligent Space Application

AUTHOR:

Balázs Tusor, Gabriella Simon-Nagy, J.T. Tóth, A. R. Várkonyi-Kóczy, Department of Mathematics and Informatics, J. Selye University, Komarno, Slovakia Doctoral School of Applied Inf. and Applied Math., Óbuda University, Budapest, Hungary Institute of Automation, Óbuda University, Budapest.

ABSTRACT:

Nowadays, there are numerous types of diets that aim to improve the quality of life, health and longevity of people. However, these diets typically involve a strictly planned regime, which can be hard to get used to or even to follow through at all, due to the sudden nature of the change. In this paper, the framework for an Intelligent Space application is proposed that helps its users to achieve a healthier diet in the long term by introducing small, gradual changes into their consumption habits. The application observes the daily nutrition intake of its users, applies data mining in order to learn their personal tastes, and educates them about the effects of their current diet on their health. Then it analyzes the knowledge base to find different food or drink items that align with the perceived preferences, while also add to the balance of the daily nutrition of the users considering their physical properties, activities, and health conditions (e.g. diabetes, celiac disease, food allergies, etc). Finally, the system uses the findings to make suggestions about adding items from the consumption list, or change one item to another.

ADVANTAGE:

The framework of an Intelligent Space application is proposed for educating human users about nutrition science and helping them achieve a healthier diet in the long term by introducing small but gradual changes to their consumption habits.

DISADVANTAGE:

The system need to be improved in order to account for the time of the day as well when the recommendations are considered, as some food types are more beneficial to consume at certain times of the day.Furthermore, the system should also take variety into account, to enhance user experience.

PAPER:2

TITLE: Profile-based System for Nutritional Information Management

AUTHOR:

Rui Costa1, Luís Marcelino1, Catarina Silva121School of Technology and Management / Research Center for Informatics and Communications Polytechnic Institute of Leiria – Portugal 2CISUC – Centre for Informatics and Systems Of the University of Coimbra – Portugal.

ABSTRACT:

Nowadays health concerns are effectively becoming ubiquitous. Most people have the need to effectively control their nutritional consumptions, mostly due to health issues. Personal computational devices may assist this control with a solution that allows an efficient management of each individual nutritional profile. In this work we propose a mobile service architecture that allows users to manage their nutritional information, using a profile-based system and build shopping lists based on the user's profiles. This application may contribute to the improvement of the lifestyle of the population through the recommendation of food and drinks that fit their profile of restrictions and/or nutritional options (for instance, due to hypertension or obesity, among others). The person's profile can be accessed and configured on a mobile device. A set of predefined templates provides the initial rules that may be customized to represent specific individual nutrition rules. The rules defined in the profile can later be used to filter the food presented to each user. The paper includes preliminary usability results from experiments using real data to validate the approach. These results suggest it could be used in real scenarios, although it may require more than simply filtering results.

ADVANTAGE:

The area of nutritional advice and counseling hasn't been properly explored leaving room for a solution combining both areas of shopping assistants and nutritional control. This paper proposes a technological solution allowing people to elaborate their shopping lists based on food recommendations that fit in their profile of nutritional restrictions by filtering the products available that match the set of rules defined in that profile.

DISADVANTAGE:

The project need to work on directions consist of integrating the existing product database with a real retail chain supplier, which would add an increased value to the solution and allow the access to a large and an up to date database of products and characteristics.

PAPER:3

TITLE: Monitoring Eating Behaviors for a Nutritionist E-Assistant Using Crowdsourcing

AUTHOR:

Mario O. Parra and Jesus Favela, Ensenada Center for Scientific Research and Higher Education Luis A. Castro, Sonora Institute of Technology Arturo Morales, Ensenada Center for Scientific Research and Higher Education.

ABSTRACT:

Advances in behavior recognition and monitoring have fostered thedevelopment of applications aimed at supporting behavior change. While technologies for tracking behaviors such as caloric expenditure or sleeping habits have matured, tracking eating habits remains essentially unsolved. Eating behaviors of interest might include eating late at night, prolonged fasting, or regular fast-food consumption. Estimating food intake is particularly relevant to health-related issues such as diabetes and obesity. Nutrition specialists usually tailor dietary regimens to patients' preferences and needs. However, patients might change dishes or ingredients due to availability or preferences. If changes in the dietary regimen are to occur (for example, no eggs available for breakfast), then it is important to make proper adjustments to the diet. Using a crowd to assess what patients are eating can be a convenient way to validate whether patients are following their diet.

ADVANTAGE:

The approaches offer different advantages in terms of latency, cognitive load, and accuracy. On the basis of our results, we devised a variant of A5 for Lucy, because it offered the highest accuracy with only a few raters required. Although A5 had the highest latency, the proposed variant reduced latency by 20 percent. Both Lucy and the crowd assessment have the potential to facilitate the work of nutrition experts in coaching multiple patients 24/7. Potential users were enthusiastic about adopting Lucy for future use.

DISADVANTAGE:

Need for evaluating the use of Lucy in naturalistic environments to assess participants' performance when the digital assistant is incorporated into their nutritional program. We also plan to propose and evaluate incentives to encourage the crowd to rate photographs of meals

PAPER:4

TITLE: Plan-Cook-Eat: A Meal Planner App with Optimal Macronutrient Distribution of Calories Based on Personal Total Daily Energy Expenditure

AUTHOR:

Manuel B. Garcia College of Computer Studies Institute of Technology, Far Eastern University Manila.

ABSTRACT:

One essential factor of a balanced diet to prevent morbidity and mortality, and promote a good nutritional status is the consumption of nutrient-dense foods with an appropriate macronutrients dispersal (carbohydrates, protein, fat) and the right amount of calories based on personal energy expenditure. While the field of dietetics and nutrition has been bombarded with food recommender systems over the years, little research has been performed on meal planner applications grounded on macronutrients compliance. Drawing from a parallel-iterative design methodology, this paper proposed the development of a web-based meal planner app called 'Plan-Cook-Eat' that can generate tailored diet plans according to individual's needs. Six Registered Nutritionists–Dietitians served as a panel of human expert validators and 24 regular users served as app testers for evaluation using mixed-methods approach. Study participants confirmed and concluded the potential of Plan-Cook-Eat web app as a personal meal planner to ensure the consumption of needed macronutrients. Suggestions and interpretations were made regarding the technical improvements that could be done to enhance the app as a complete virtual nutrition assistant.

ADVANTAGE:

Plan-Cook-Eat will redound to the benefit of humanity, that is, anyone who consider nutrition as a key aspect of leading a long and healthy life. The digitalization of meal planner with respect to optimal macro distribution will provide a better patient care and improve public health as the advancement of nutrition knowledge and the development of personalized nutrition intervention are available to all.

DISADVANTAGE:

The system needs to cover the inclusion of grounding the web application into an international standardized framework called Nutrition Care Process, and the practice of evidenced-based dietetics to personalized nutrition care for formulating tailored dietary interventions based on personal preferences(e.g., dietary type like Vegan or cooking style like Filipino cuisine), health-related restrictions (e.g., allergy and disease-related barrier), and fitness objectives. Lastly, a clinical trial will be piloted to test the effectiveness of the nutrition app.

PAPER:5

TITLE: Fitness Nama Using Python Language, MYSQL, SQLyog And Anaconda Software

AUTHOR:

Divyanshu Kumar1, Anthony Paul Joseph2, Priyanka Subhash Junghare3, Neha Raikwad4, Arati khokale 5,Prof. Vijaya kamble 61,2,3,4,5Final Year Student, Department of Computer Science and Engineering, GNIET, Nagpur,Maharashtra, India 6 Professor, Department of Computer Science and Engineering, GNIET, Nagpur, Maharashtra, India.

ABSTRACT:

Health problems associated with diet,including obesity and cancer, are important concerns within the current society. The main treatment for obesity includes dieting and frequent physical activity. Diet programs keep and cause weight loss over short, medium, or future. However, to take care of balanced body energy, a frequent workout is required. This paper presents Sapo Fitness, a mobile health application for a dietary evaluation and therefore the implementation of challenges, alerts, and constantly motivates the user to use the system and keep the diet plan. Sapo Fitness is customized to its user keeping a daily record of his/her food intake and daily exercise. The main goal of this application is to supply a motivation tool for weight reduction. SapoFitness includes the ability to share personal achievements with social networks, a very intuitive human-device interaction and control weight, applying not only to control obesity but also to malnutrition problems. The application offers a continuous alert system activity, sending alerts/messages concerning the user diet program taking into account also his/her physical activity. SapoFitness may be a challenged mobile application that delivers the action to the user, motivating for a healthier lifestyle.Our system enables users without knowledge about nutrition to look easily for recipes with tongue to enhance specific health conditions. The tongue includes ‘I want to cure my acne’ and ‘I want to get over my fatigue’.

ADVANTAGE:

The project titled Fitness nama is a hybrid-based application that enables the user to stay an eye fixed on their fitness regime. The project has been completed successfully with maximum satisfaction.

DISADVANTAGE:

There should be different kinds of health and fitness sensors. Second, investigation and evaluation of scenarios where multiple accelerometer based body mounted sensor can be used to capture body motions that cannot be captured with a pedometer such as push ups, pull ups, bench press, arm curls etc. Involvement of a professional design firm to create blue print for production version of DFC. The system should consider a cloud based data storage to which user can push their health and fitness data and access from variety of access points.

PAPER:6

TITLE: Smartphone Applications for Promoting Healthy Diet and Nutrition

AUTHOR:

Steven S. Coughlin, PhD1,* , Mary Whitehead, MPH, CHES2, Joyce Q. Sheats, RN, MPH3, Jeff Mastromonico4, Dale Hardy, PhD, RD, LD, CDE, CHES5, and Selina A. Smith, PhD, MDiv3,6 1Department of Community Health and Sustainability, Division of Public Health, College of Health Science, University of Massachusetts, Lowell, MA, USA 2SISTAAH Talk Breast Cancer Support Group, Miami, FL, USA 3 Institute of Public and Preventive Health, Georgia Regents University, Augusta, GA, USA 4Educational & Collaborative Technology Center. Georgia Regents University, Augusta, GA, USA 5College of Allied Health Sciences, Georgia Regents University, Augusta, GA 6Department of Family Medicine, Medical College of Georgia, Georgia Regents University, Augusta

ABSTRACT:

Background—Rapid developments in technology have encouraged the use of smartphones in health promotion research and practice. Although many applications (apps) relating to diet and nutrition are available from major smartphone platforms, relatively few have been tested in research studies in order to determine their effectiveness in promoting health. Methods—Inthis article, we summarize data on the use of smartphone applications for promoting healthy diet and nutrition based upon bibliographic searches in PubMed and CINAHL with relevant search terms pertaining to diet, nutrition, and weight loss through August 2015. Results—A total of 193 articles were identified in the bibliographic searches. By screening abstracts or full-text articles, a total of three relevant qualitative studies and 9 randomized controlled trials were identified. In qualitative studies, participants preferred applications that were quick and easy to administer, and those that increase awareness of food intake and weight management. In randomized trials, the use of smartphone apps was associated with better dietary compliance for lower calorie, low fat, and high fiber foods, and higher physical activity levels (p=0.01-0.02) which resulted in more weight loss (p=0.042-<0.0001).

ADVANTAGE:

The selected reports included qualitative research studies involving focus groups and randomized control trials of the effectiveness of smartphone apps to improve diet and nutrition and control weight. Some studies also examined the accuracy of diet and nutrition measurements involving smartphone devices and personal data assistants (PDAs).

DISADVANTAGE:

Future studies should utilize randomized controlled trial research designs, larger sample sizes, and longer study periods to better establish the diet and nutrition intervention capabilities of smartphones. There is a need for culturally appropriate, tailored health messages to increase knowledge and awareness of health behaviors such as healthy eating.

PAPER:7

TITLE: Mobile Applications for Nutrition Management

AUTHOR:

Kristen M.J. Azar, RN, MSN/MPH, Lenard I. Lesser, MD, MSHS, Brian Y. Laing, MD, Janna Stephens, RN, Magi S. Aurora, BS, Lora E. Burke, PhD, MPH, FAHA, FAAN, Latha P. Palaniappan, MD, MS.

ABSTRACT:

Overweight and obesity continue to be common, costly, preventable public health issues in the U.S., where nearly seven of every 10 adults would benefit from weight loss. Current methods of promoting weight reduction through lifestyle intervention, reliant on intensive educational and counseling sessions to promote reduction in energy intake and increased energy expenditure, have largely failed to change the trajectory of the obesity epidemic. Although research is limited, some studies have suggested a benefit to using technology, such as Internet and mobile technologies, to deliver health behavior interventions for lifestyle behavior change and weight management. The development of smartphones has led to a proliferation of software applications (apps), which offer a relatively new and promising approach to behavioral lifestyle interventions by enhancing the delivery of interventions to individuals en masse with favorable cost utility. Apps can potentially serve as a platform from which behavioral interventions can be delivered. Of an estimated 91% of U.S. adults who currently own a mobile phone, 61% own smartphones.12 Half of all smartphone owners have used their phone to search for health information, with 60% of all downloaded health related apps involving the topics of “weight loss” and “exercise.” However, with more than 10,000 apps currently offered that specifically target diet and weight loss, assessing the effectiveness of apps in promoting behavior change is a difficult task in the absence of efficacy studies.

ADVANTAGE:

Of the 200 apps that were considered, 78 were primarily aimed at promoting physical activity, 88 were not related to diet/nutrition or anthropometric tracking, three were excluded for focusing on a specific diet subcategory, and eight were excluded because of not being stand-alone. A total of 23 apps met the inclusion criteria. These 23 apps were subsequently organized into five subcategories. Dietary tracking apps was the largest category, containing a total of 12 apps. All categories initially contained more than two apps. After selecting the top two apps in each subcategory, the final sample consisted of 10 apps.

DISADVANTAGE:

Further research efforts are needed to formally evaluate and identify the features within apps that are most effective in promoting sustainable lifestyle change.

PAPER:8

TITLE: Modern Technologies for Personalized Nutrition

AUTHOR:

Mike Boland , Fakhrul Alam and John Bronlund Riddet Institute, Massey University, Palmerston North, New Zealand Massey University, Auckland, New Zealand.

ABSTRACT:

The fusion of digital technologies with almost all real-world activities—sometimes known as the Fourth Industrial Revolution—is changing the world. It is changing how food is researched, perceived, purchased, and used by the consumer, and it has important implications for convenience, diet, and health. It has the potential to enable personalized nutrition on an unprecedented scale. The Internet of Things (IoT) is expected to have 20 billion devices (excluding smartphones and computers) connected by 2020 (Hung, 2017). These devices enable automated purchasing of food supplies. For example, consider smart refrigerators and smart containers that know what they contain and can order resupplies online from the supermarket (e.g., Samsung Family Hub, Neo Smart Jar), apps for tablets and smartphones that can scan and reorder packaged goods (e.g., Chefling), and attachments for garbage cans that can read barcodes on packaging or recognize voice descriptions and automatically reorder the product (e.g., GeniCan). At present these are relatively simple scan and reorder systems. But coupled with nutritional data from big datasets and appropriate personal details, the possibility exists for an artificial intelligence (AI) engine to design diets, meals, and menus and tailor food purchasing to deliver personalized nutrition in new and very convenient ways. There are evolving devices, including a myriad of smartphone apps, that can recognize food items (from barcodes and from image analysis) and link to datasets for nutritional composition and provide dietary advice.

ADVANTAGE:

There is a wide range of relatively new technologies and applications that can assist with personalized nutrition. However, a holistic system that brings them together does not yet exist. Moreover, there are severe deficiencies in some of the assistive systems, notably smartphone apps, that bring into question their accuracy, reliability, and hence usefulness in their present state.

DISADVANTAGE:

The system need for oversight and regulation of these systems to ensure appropriateness, accuracy, and reliability of all components before any system can be relied on for dietary advice. Not with standing these limitations, there should be good scope for at least partial systems to manage personalized nutrition, and undoubtedly new, better systems will emerge in the near future.

PAPER:9

TITLE: Nutrition Monitoring and Dietary Management System

AUTHOR:

P. Kamakshi Priyaa, Dr. L. Arockiam M. Phil. Scholar, Associate Professor Dept. of Computer Science St. Joseph's College, Tiruchirappalli, Tamil Nadu, India.

ABSTRACT:

A well balanced diet with an estimated nutrient intake is vital for infants and children which reduces the risks of deadly diseases namely cancer, diabetes, obesity and cardiovascular diseases. Unlike adults, infants require some assistance in their food intake. The survey provides valuable insights about the various advancements of IoT in the healthcare industry and the need for nutrition and dietary monitoring. A varied number of nutrition monitoring systems for the estimation and prediction of calories have been developed using various machine learning techniques and also with advanced deep learning based techniques. A comparative view of the previous works of researchers in the recent times has been provided. The IoT has the capability to safeguard the health of a patient but also helps the physicians to ensure care. An analysis was conducted in India on the various features that affect infant mortality rate in the Indian states. Systematic monitoring of the daily nutrient intake in infants and ensuring that there exists a balance is very important for the healthy growth of children. Most of the children in their budding age suffer undernutrition which is the main reason for infant child mortality and morbidity. Almost 90% of the children suffering from undernutrition are from the developing countries . Fulfilling the balanced nutrition requirement of the children helps to reduce malnutrition and also reduces the threat of other diseases that are encountered due to lack of nutrition.

ADVANTAGE:

The Internet of Things (IoT) is a booming technology that spans across various domains and its incorporation with healthcare is increasing day to day. This survey presents a comparative view on the research works in the nutrition monitoring, calorie estimation and dietary systems. The machine learning techniques are being replaced by the deep learning techniques that outperforms the traditional methodologies. There is also an increase in the integration of wearable sensors along with smartphone through mobile technologies which will be a revolution in food monitoring systems which helps in disease prediction, risk analysis and prevention.

DISADVANTAGE:

After the food items have been identified, the nutrient content has to be analysed. The volume estimation is done on the segmented food and the corresponding nutrient value is calculated using respective tables namely USDA Food Composition Database. The volume can either be underestimated or overestimated due to external factors like lighting conditions, blurred pictures, and noisy.

PAPER:10

TITLE: Measuring Calorie and Nutrition From Food Image

AUTHOR:

Parisa Pouladzadeh, Shervin Shirmohammadi, Senior Member, IEEE, and Rana Al-Maghrabi.

ABSTRACT:

As people across the globe are becoming more interested in watching their weight, eating more healthy, and avoiding obesity, a system that can measure calories and nutrition in every day meals can be very useful. In this paper, we propose a food calorie and nutrition measurement system that can help patients and dietitians to measure and manage daily food intake. Our system is built on food image processing and uses nutritional fact tables. Recently, there has been an increase in the usage of personal mobile technology such as smartphones or tablets, which users carry with them practically all the time. Via a special calibration technique, our system uses the built-in camera of such mobile devices and records a photo of the food before and after eating it to measure the consumption of calorie and nutrient components. Our results show that the accuracy of our system is acceptable and it will greatly improve and facilitate current manual calorie measurement techniques.

ADVANTANGE:

In this paper, we proposed a measurement method that estimates the amount of calories from a food's image by measuring the volume of the food portions from the image and using nutritional facts tables to measure the amount of calorie and nutrition in the food. As we argued, our system is designed to aid dieticians for the treatment of obese or overweight people, although normal people can also benefit from our system by controlling more closely their daily eating without worrying about overeating and weight gain.

DISADVANTAGE:

We focused on identifying food items in an image using image processing and segmentation, food classification using SVM, food portion volume measurement, and calorie measurement based on food portion mass and nutritional tables. Our results doesn't provide accuracy of our method in area measurement, and subsequently volume and calorie measurement. An obvious avenue for future work is to cover more food types from a variety of cuisines around the world. In addition, more work is needed for supporting mixed or even liquid food, if possible.