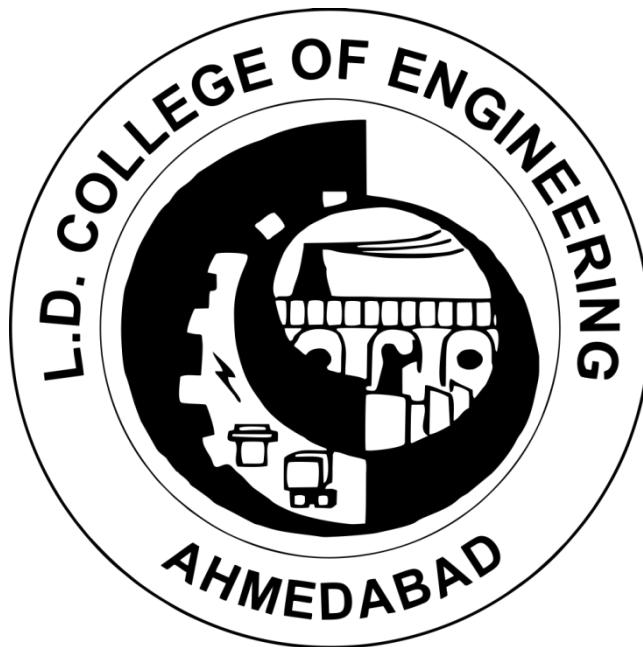


Calorie Intake Detection and Guide to Food



2018-19

UDP Project / Team ID: 14664

By

Patel Anuj Narendrakumar (150280116067)
Patel Mihir Maheshkumar (150280116076)

Guided by

Prof. Bakul Panchal

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L. D. College of Engineering

Department of Information Technology

Academic Year

2018-19

CERTIFICATE

This is to certify that the Project Report, submitted for the project entitled **Calorie Intake Detection and Guide to Food** has been carried out by **Patel Anuj Narendrakumar (150280116067)** and **Patel Mihir Maheshkumar (150280116076)** at Information Technology Department of L. D. College of Engineering for fulfilment of B.E. degree to be awarded by Gujarat Technological University. This Project work has been carried out under my supervision and is to my satisfaction.

Place:

Date:

Internal Guide

Head of the Department

External Faculty

Prof. Bakul Panchal

Dr. Hiteishi Diwanji

PLAGIARISM SCAN REPORT

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October 11, 2018

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Acknowledgements

We would like to express our special thanks of gratitude to our faculty guide Prof. Bakul Panchal who gave us the opportunity to do this wonderful project which also helped us in doing a lot of research and we came to know about so many new things we are really thankful to them.

Secondly, we would also like to thank our friends who helped us a lot in finalizing this project within the limited time frame.

Chapter 1. Introduction

1.1. Problem Summary and Introduction

The problem we are trying to solve is the problem we face when we cannot find nutrient information and end up eating food which is not beneficial to us.

1.2. Aim and objectives of the project

This project aims to provide insights into eatables and beverages to help people improve their diet.

1.3. Problem Specifications

One cannot determine calorie information and nutrients on one's own. One has to be dependent on food item providers' description of nutritional information. Real time nutritional details are not available to many who need it.

1.4. Brief literature review and Prior Art Search (PAS) about the project

We used Google Patents website for prior art search. We did Patent Search and Analysis on the website and found some interesting ideas related to our problem specifications.

An invention was based on training of models on image based datasets to extract nutritional content of food. This invention was based on food images from different places of various categories. Another invention revolved around suggesting diet on the basis of user's previous food consumption. All Patent Search and Analysis done are described in detail in Appendix.

1.5. Plan of their work

A work included use of Spectroscopy and 3D imaging analysis. Another work was having a technique of recognising scenes under surveillance. An interesting plan was based on digital computing or data processing equipment or methods, specially adapted for specific application.

1.6. Materials / Tools required

- Tools required for Spectroscopy
- Tools capable of 3D image analysis
- Optical sensors
- Image capturing devices

Chapter 2. Design: Analysis, Design Methodology and Implementation Strategy

2.1. Ideation

In ideation phase, we seek to define our problem and possible solutions to the same with the help of ideation canvas containing various fields such as People, Activities, Situation / Context/ Location and Props/Possible Solutions which are described in detail below.

2.1.1. People

- Health conscious
- People having restrictions imposed by doctors
- People having certain physical goals
- Naive users

2.1.2. Activities

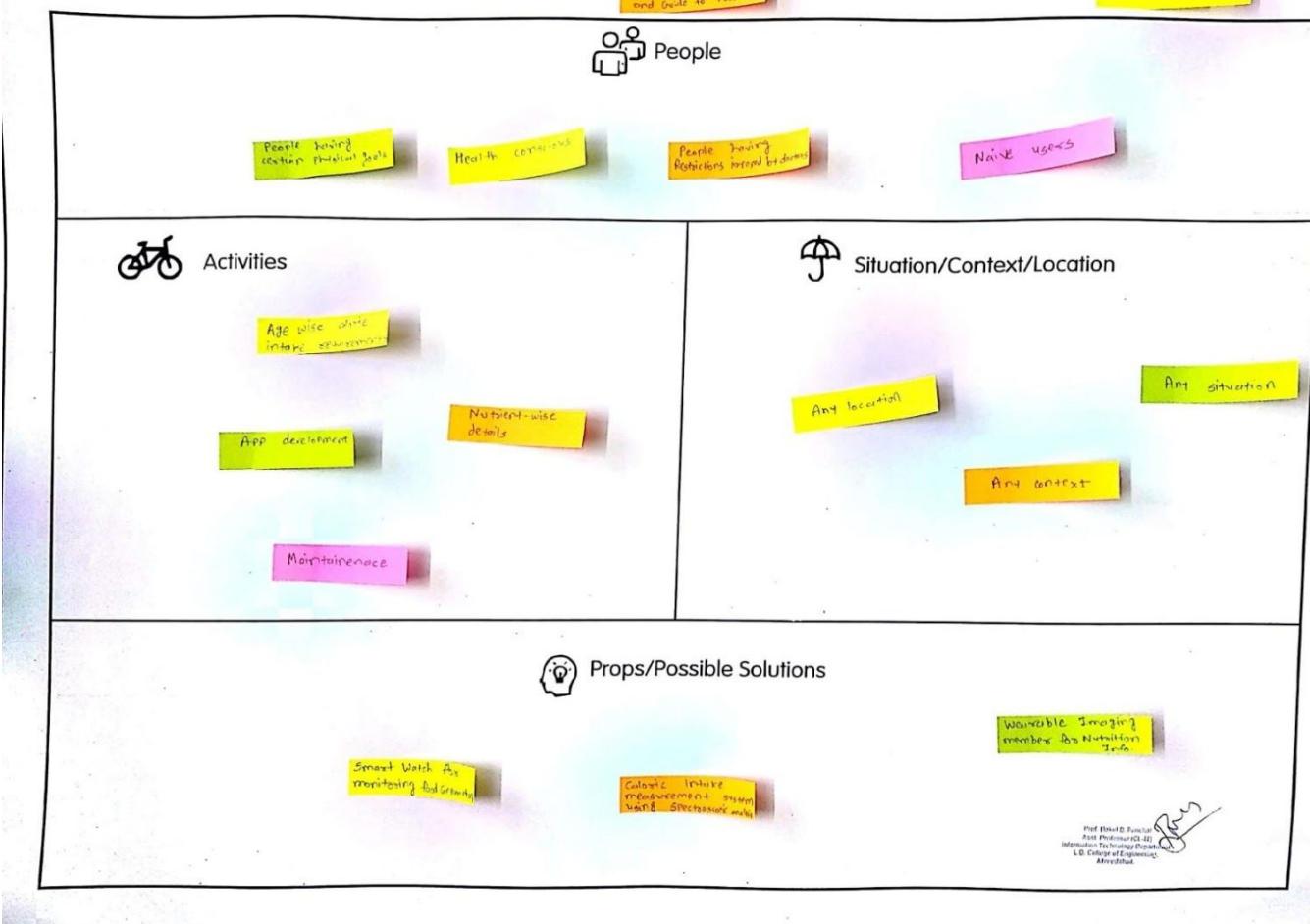
- Gathering of age-wise calorie intake requirements
- Nutrient-wise details
- App development
- Maintenance

2.1.3. Situation / Context / Location

- Almost any location
- Any context where health is concerned
- All situations where app usability is feasible

2.1.4. Props / Possible Solutions

- Smart watch for monitoring food consumption
- Calorie intake measurement using spectroscopic analysis
- Wearable imaging member for nutrition information

**Fig.2 (a) Ideation Canvas**

2.2.AEIOU Summary

This phase focuses on brainstorming activities to elaborate the solutions to the problem. AEIOU, itself, has a meaning which includes 5 tasks like Activities, Environment, Interactions, Objects, and Users. Each of these is discussed in detail below.

2.2.1. Activities

- Gathering of age-wise calorie intake requirements
- Nutrient-wise details
- App development
- Maintenance

2.2.2. Environment

- Generic Environment

2.2.3. Interactions

- Capturing image of food item
- Food guide
- Feedback

2.2.4. Objects

- Computer
- Android device
- Internet connection

2.2.5. Users

- Health conscious
- People having restrictions imposed by doctors
- People having certain physical goals
- Naive users

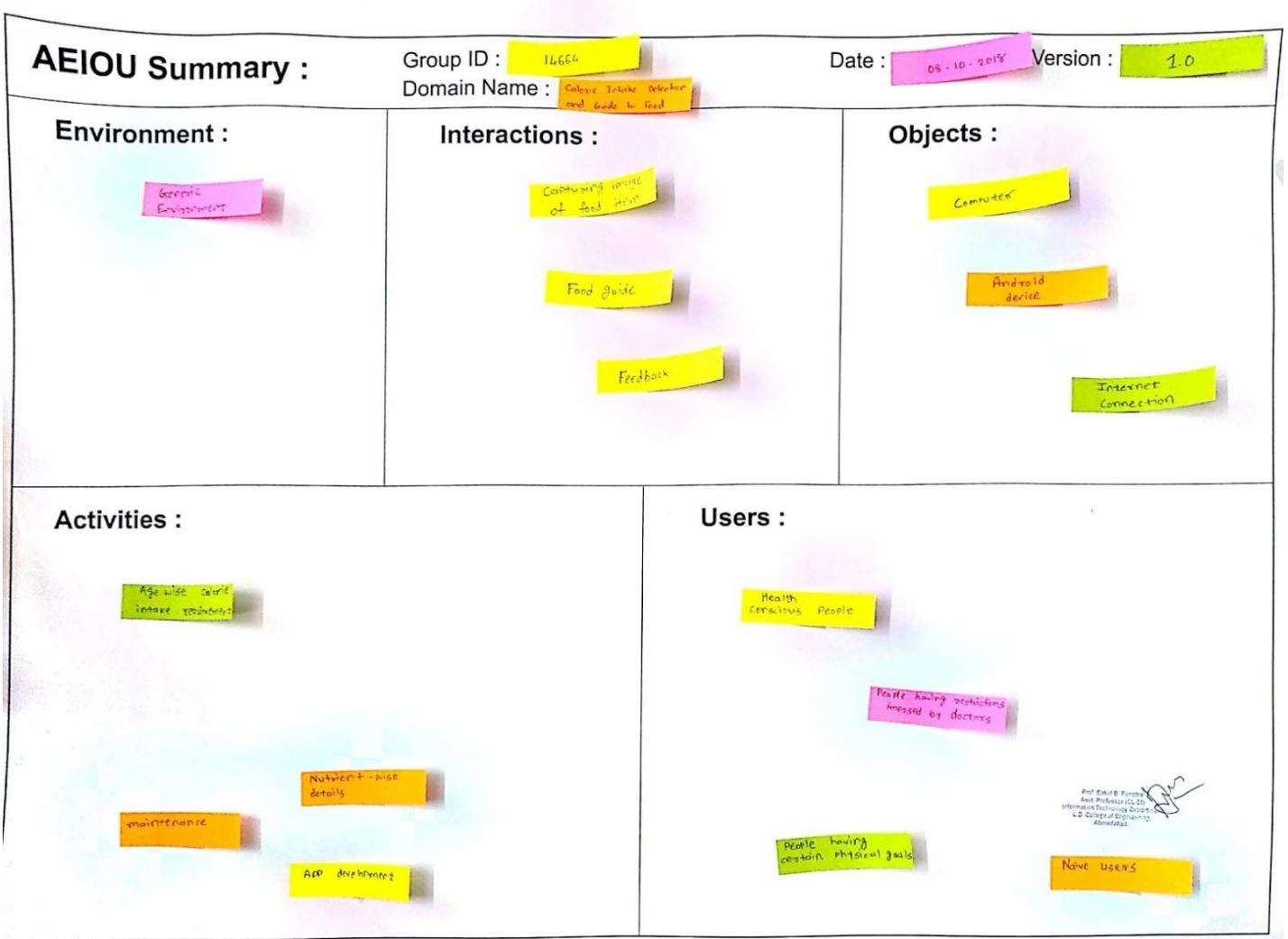


Fig. 2 (b) AEIOU Summary Canvas

2.3. Empathy Summary

After having AEIOU summary in hand, now, we focus on challenges that may thwart the solution of the problem. Then, top 5 problems that people are facing and at last, choose the best one to move ahead.

2.3.1. Input Through AEIOU Summary

- Generic environment
- Android device
- Health conscious people
- Gathering age-wise calorie intake requirements
- Capturing food image

2.3.2. Scouted Challenges

- Finding best algorithm
- Image processing
- Availability on all platforms
- Capturing nutrient information
- Recommendation of diet plan

2.3.3. Top 5 Problems

- No real time support for calorie intake information
- Dependency on dietician
- Requires heavy machinery

2.3.4. Choose Exact Problem

- Calorie detection by mobile device
- Diet recommender

Empathy Summary

Design For :
Catering Sector (Delhi)
User Guide to Food

Design BY :
Team 10
Area no. 101

Date :
05-10-2018

Version :
1.0

Input through AEIOU framework

Demographic
Information
Age wise gender
Income bracket
Education level
Gender
Ages
Food
Food sensitivity
Food

Photo Grid

Scouted challenges

Finding best algorithm
Image processing
Availability on all platforms
Gathering visualized information
Recommendation of diet plan

No recall time support for calorie intake info.

Dependent on dieticians

Requires heavy machinery

Choose exact problem from five possibilities
or by combinations of them

Top 5 problems on the basis of
Desirability, Feasibility & Viability

Fig. 2 (c) Empathy Canvas

Prof. Balaji B. Raghava
Asst. Professor (O.G.)
Information Technology Deptt.
A.P.G.C.E. Deemed to be University
Anantapur

2.4. Product Development

This is the final step toward the development of the solution to the problem which includes defining Purpose, People, Product Experience, Product Functions, Product Features, Components, Customer Revalidation, Reject, Redesign and Retain

2.4.1. Purpose

- Solves a problem
- Serves a need

2.4.2. People

- Health conscious
- People having restrictions imposed by doctors
- People having certain physical goals

2.4.3. Product Experience

- Feeling convenience

2.4.4. Product Functions

- Calorie detection
- Guidance of diet

2.4.5. Product Features

- Recommend better diet

2.4.6. Components

- Machine learning algorithm
- Image processing
- App development

2.4.7. Customer Revalidation

- Not done yet

2.4.8. Reject, Redesign, Retain

- Reiterating

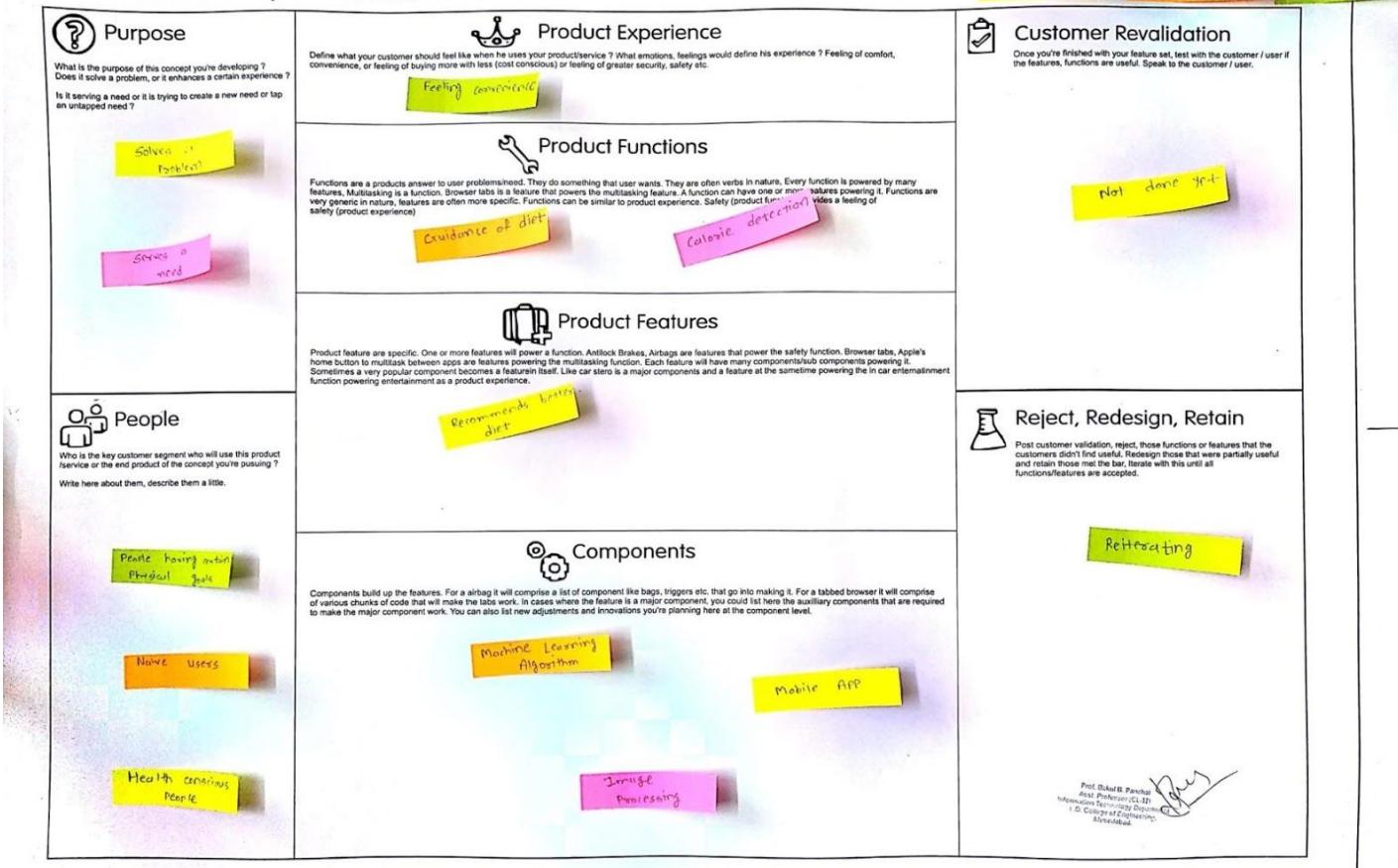
Product Development Canvas

Team/Date/Version :

14/06/24

06 - 10 - 2018

1.0



Prof. Sandeep B. Panigrahi
Asst. Professor (CSE)
Interactions Technologies Department
I.O. College of Engineering,
Rourkela



Fig. 2 (d) Product Development Canvas

Chapter 3. Implementation

3.1.Data to be used

We collected required data from different sources which contain Age-wise calorie requirements and nutrients along with their sources of food.

3.1.1. Age wise calorie requirements

Age	Sedentary	Moderately Active	Active
2	1,000	1,000	1,000
3	1,000	1,400	1,400
4	1,200	1,400	1,600
5	1,200	1,400	1,600
6	1,400	1,600	1,800
7	1,400	1,600	1,800
8	1,400	1,600	2,000
9	1,600	1,800	2,000
10	1,600	1,800	2,200
11	1,800	2,000	2,200
12	1,800	2,200	2,400
13	2,000	2,200	2,600
14	2,000	2,400	2,800
15	2,200	2,600	3,000
16	2,400	2,800	3,200
17	2,400	2,800	3,200
18	2,400	2,800	3,200
19-20	2,600	2,800	3,000
21-25	2,400	2,800	3,000
26-30	2,400	2,600	3,000
31-35	2,400	2,600	3,000
36-40	2,400	2,600	2,800
41-45	2,200	2,600	2,800
46-50	2,200	2,400	2,800
51-55	2,200	2,400	2,800
56-60	2,200	2,400	2,600
61-65	2,000	2,400	2,600
66-70	2,000	2,200	2,600
71-75	2,000	2,200	2,600
76 and up	2,000	2,200	2,400

3.1.2. Nutrients and sources

Nutrient/Minerals	Importance	Source
Carbohydrates	Fuel for brain and muscles	Whole Grains(Major), Fruits, Vegetables
Healthy Fats	Provide energy, healthy skin, absorb certain vitamins, brain development	Avocados, Olives ,Nuts, Fish , Oils(Olive Oil or Canola Oil)
Protein	Building blocks for bones, muscles, cartilage, skin and blood. Make important enzymes, hormones and vitamins. Helps normalize blood sugar.	Soy, dairy and nuts for vegetarian. Lean beef and pork, chicken and turkey, beans or tofu.
Vitamin A	Healthy eyes and general growth and development, including healthy teeth and skin.	Carrots and other orange foods including sweet potato and cantaloupe melons
B Vitamins	Energy production, immune function and iron absorption.	Whole unprocessed foods, specifically whole grains, potatoes, bananas, lentils, chilli peppers, beans, yeast and molasses.
Vitamin C	Strengthening blood vessels and giving skin its elasticity, anti-oxidant function and iron absorption.	oranges, guava, red and green peppers, kiwi, grapefruits, strawberries, Brussels sprouts and cantaloupe
Vitamin D	Strong healthy bones.	Natural sunlight, eggs, fish and mushrooms
Vitamin E	Blood circulation and protection from free radicals.	almond, nuts, sunflower seeds and tomatoes
Vitamin K	Blood coagulation – that is, the process by which your blood clots.	Leafy greens such as kale, spinach, Brussels sprouts and broccoli.
Folic Acid	Cell renewal and preventing birth defects in pregnancy.	Dark leafy greens, asparagus, broccoli, citrus fruits, beans, peas, lentils, seeds, nuts, cauliflower, beets and corn.
Calcium	Healthy teeth and bones.	dairy products like yogurt, cheese and milk, along with tofu and black molasses
Iron	Building muscles naturally and maintaining healthy blood.	soybeans, cereal, pumpkin seeds, beans, lentils and spinach
Zinc	Immunity, growth and fertility.	Sea foods like oysters are also zinc-rich, along with spinach, cashews, beans and dark chocolate
Chromium	Glucose function – making sure every cell in your body gets energy as and when needed.	whole grains, fresh vegetables and herbs

3.1.3. Snapshots of layout

3.1.3.1. Home Page

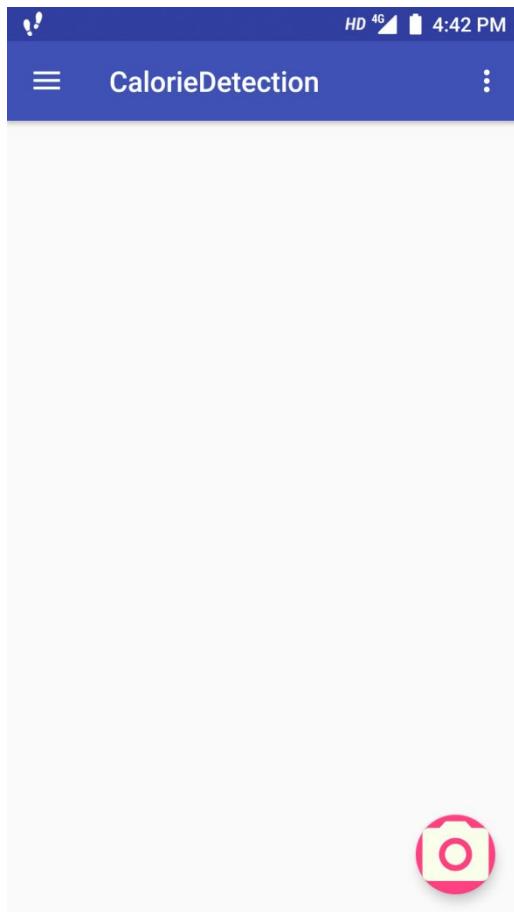


Fig. 3 (a) Home Page with camera icon to capture image

3.1.3.2. Asking user permission

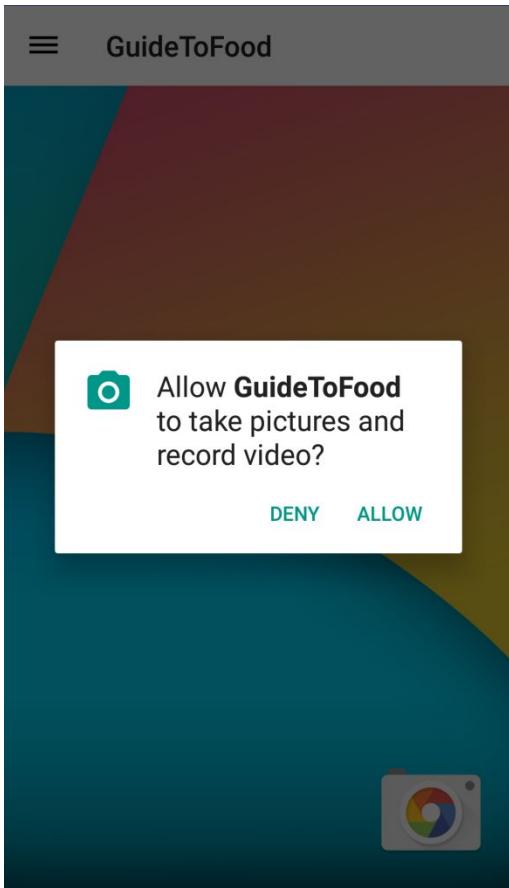


Fig. 3 (b) User Permission to use camera

3.1.3.3. App drawer providing additional information

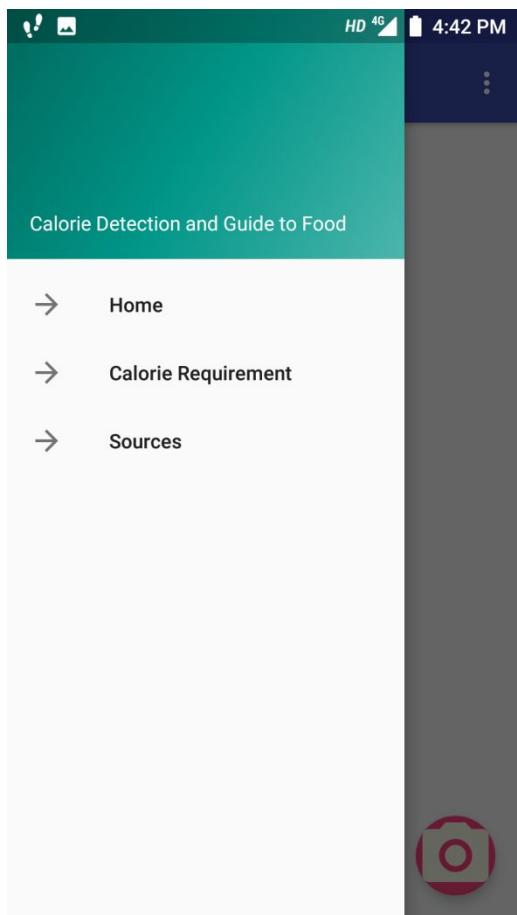


Fig. 3 (c) App drawer

3.1.3.4. Calorie requirements

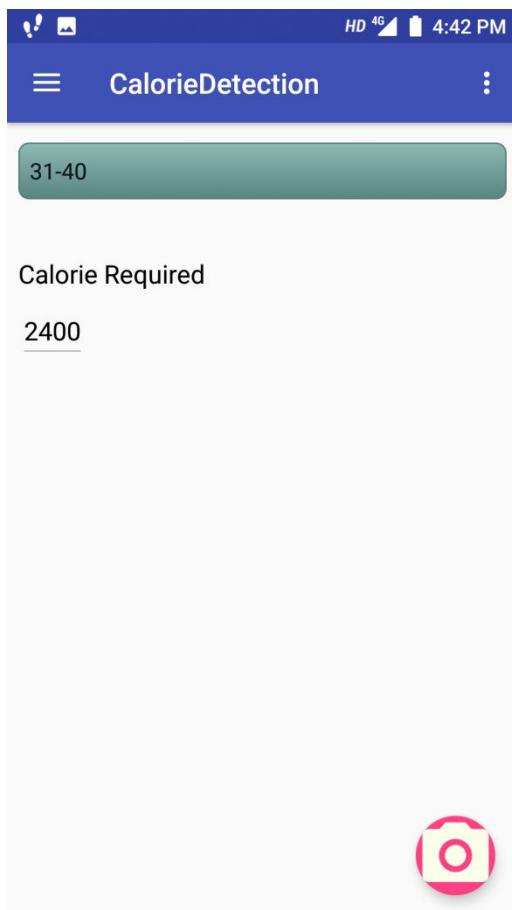


Fig. 3 (d) Showing calorie requirement by age

3.1.3.5. Sources of nutrients

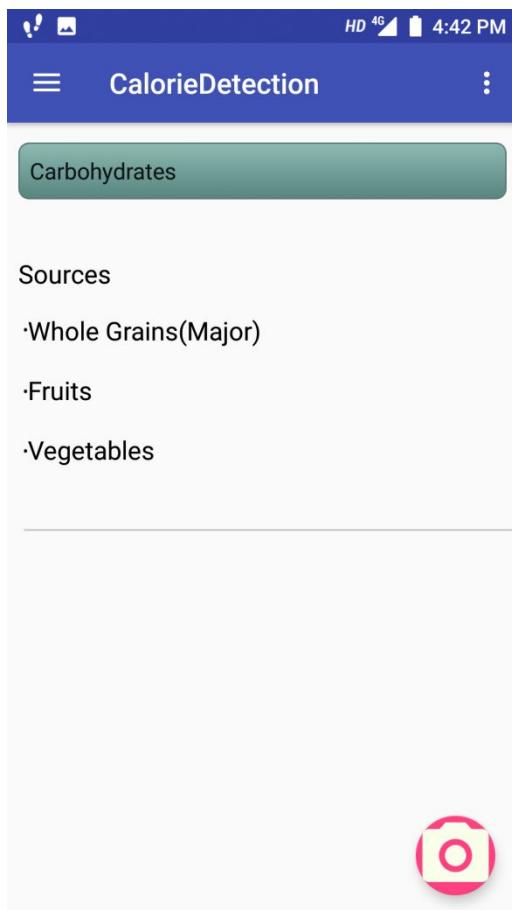


Fig. 3 (e) Nutrients and sources

Chapter 4. Summary and Scope of future work

4.1. Summary

At this point of project work, it is a kind of prototype which provides useful information about diet to users of various age groups. In addition to this, it also provides sources of nutrients which can be crucial to people falling in various categories described above in Chapter 2.

4.2. Scope of future work

Scope of this project work is significant. It can help many people when they need a proper diet. No matter what they are looking forward to – whether it is personal physical goal, body-building, maintaining a healthy body and so forth. It can be also crucial to children suffering from malnutrition. Malnutrition is a big problem in India and many African countries. On the other hand, developed countries are struggling with obesity and diseases it comes along with. So, using a system which recommends a diet is quite clearly helpful in these cases.

References

1. Calorie Requirements

<https://health.gov/dietaryguidelines/2015/guidelines/appendix-2/>

2. Dr-B-Sesikeran

<http://nutritionfoundationofindia.res.in/PPT-2011/Seven17-18teen/Dr-B-Sesikeran.pdf>

3. Nutrients Requirement For 5 Years

<https://www.parentcircle.com/article/nutrition-requirements-for-05-year-old-children/>

4. Nutrients

1. <http://www.pamf.org/youngadults/health/nutrition/needenutrients.html>
2. <https://www.goodnet.org/articles/11-essential-vitamins-minerals-your-body-needs>

5. Requirements

<http://parenting.firstcry.com/articles/a-guide-to-nutrition-for-kids/>

Appendix

Periodic Progress Reports & Patent Search and Analysis Report

11/10/2018

Periodic Progress Report (PPR) Details

[Print](#) [Back](#)

College : L. D. COLLEGE OF ENGINEERING, AHMEDABAD

StudentName : Patel Anuj Narendrakumar

EnrollmentNo : 150280116067

Department : Information Technology

MobileNo : 9601927913

Discipline : BE

Email : anujpatel360@gmail.com

Semester : Semester 7

PPR Details

Periodic Progess Report : First PPR

Project : Calorie Intake Detection and Guide to Food

Status : Submitted

1. What Progress you have made in the Project ?

Starting off the project, we are trying to look at the detailed aspects of the project we are looking forward to build. We are discussing about various ways of building the project. We are trying to imagine a scenario which can give an idea how the system will function. What options can the system offer other than the main requirement is also being considered. What are the supporting technical requirements which can support the main function of the system is also under consideration.

2. What challenge you have faced ?

The challenge we have faced is related to technical stuff. We will need to learn and master the skills which will be required in building the project. How to apply the technical knowledge we have in building a real system also seems challenging. From which component of project we should start building is also confusing. Other than these, there are also some questions like how the system will function at a specific part etc.

3. What support you need ?

The support we need is related to overcoming the challenges we are facing. In learning and mastering new skills, proper guidance will be very important. Applying correct knowledge at correct aspect will require a helping hand.

4. Which literature you have referred ?

We are referring to online news articles about some type of similar systems developed in the past. We are also referring to online content about the technologies required for the project.

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Department : Information Technology
Discipline : BE
Semester : Semester 7

PPR Details

Periodic Progess Report : Second PPR

Project : Calorie Intake Detection and Guide to Food

Status : Submitted

1. What Progress you have made in the Project ?

We did a project presentation for our internal faculty guide. Our presentation was something like an abstract representation of our project. Our guide gave us some inputs about our project. So, we are working on those inputs.

2. What challenge you have faced ?

Our challenge is to find right information that is needed for the project from online resources and discarding other which is not needed.

3. What support you need ?

The support we need is guidance. Guidance about what information from online resources will be beneficial to our project and what will not be.

4. Which literature you have referred ?

We are referring to documentation of some type of similar systems developed already. This documentation is available on the internet.

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Email : anujpatel360@gmail.com Semester : Semester 7

PPR Details

Periodic Progess Report : Third PPR

Project : Calorie Intake Detection and Guide to Food

Status : Submitted

1. What Progress you have made in the Project ?

We are continuing our project with material available online.

2. What challenge you have faced ?

Our challenge is to work with the new technologies we have not worked with in the past. This challenge is exciting in some manner.

3. What support you need ?

A proper support for our challenge will be helping hand in working with new technologies. When we are in doubt while working with these technologies we need a help from an experienced person.

4. Which literature you have referred ?

We are referring to literature available online.

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Email : anujpatel360@gmail.com

Semester : Semester 7

PPR Details

Periodic Progess Report : Forth PPR

Project : Calorie Intake Detection and Guide to Food

Status : Submitted

1. What Progress you have made in the Project ?

After discussing with our Internal Project Guide, we are looking forward to make progress in building prototype of our project.

2. What challenge you have faced ?

Working with new technology on our own is a challenge to some extent. Otherwise, everything is going in right direction.

3. What support you need ?

Mentoring for our project is the support we need. Moreover, we think support from our Internal Guide is already kind of mentoring to some extent.

4. Which literature you have referred ?

We are referring to documentation of technology we are planning to use.

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Discipline : BE

Email : mihirpatel121997@gmail.com

Semester : Semester 7

PPR Details

Periodic Progress Report : First PPR

Project : Calorie Intake Detection and Guide to Food

Status : Submitted

1. What Progress you have made in the Project ?

We started our project by defining the title for the project. Then, we began researching who can be the end users and that may be any health conscious person. After that we decided some of the features that we can provide and those are detection of nutrients from photo and whole day diet plan based on users history. Now the next step was to determine which technology to use and the answer is Machine Learning and Image Processing. The platform will be android and the plan is to make a fully functional app containing features mentioned above.

2. What challenge you have faced ?

As of now, the major challenge for this project is the processing of the image to get the necessary information from it. Also, finding perfect dataset is a big challenge.

3. What support you need ?

If we can get the correct dataset for our project then that would help us.

4. Which literature you have referred ?

As of now we have referred the Wikipedia to begin with. Also some of the articles from different websites helped us to better understand our project.

College : L. D. COLLEGE OF ENGINEERING, AHMEDABAD

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Semester : Semester 7

PPR Details

Periodic Progress Report : Second PPR

Project : Calorie Intake Detection and Guide to Food

Status : Submitted

1. What Progress you have made in the Project ?

After deciding the topic and the technologies for the project, we moved ahead for finding relevant dataset which can meet our requirements. We have found some sources from where we can acquire the required dataset. Then, we focused on the pre-processing of the images in the dataset and we have found a way to do that also.

2. What challenge you have faced ?

First, how to learn the technologies required for this project and second, after having enough knowledge about these technologies, how to apply them to meet our goal.

3. What support you need ?

Any guidance regarding the Machine Learning as well as Image Processing would be helpful to us.

4. Which literature you have referred ?

Some websites that provide datasets. Also, those which guide us to learn the technologies we require.

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Semester : Semester 7

PPR Details

Periodic Progress Report : Third PPR

Project : Calorie Intake Detection and Guide to Food

Status : Submitted

1. What Progress you have made in the Project ?

As our project needs to meet the goal Guide to Food, we started working on it. To begin with, we did some research on nutrients and supplements needed by the human body on a daily basis. We found an initial stage information from different websites and books, some of them were by Government Health care. Now we have all the basic information about nutrients and their sources as well as daily needs categorized in different age groups.

2. What challenge you have faced ?

Though we have basic knowledge about nutrients and their requirements, there is a lot to explore. We have to meet the large list of nutrients to make our project effective.

3. What support you need ?

I think if we would have a proper dietitian, then it would be a lot easy to gather all the information that we need for our project.

4. Which literature you have referred ?

For all basic information we have referred to some of health related websites like, nutritionfoundationofindia.res.in, parenting.firstcry.com, parenting.firstcry.com, parenting.firstcry.com and parenting.firstcry.com.

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College : L. D. COLLEGE OF ENGINEERING, AHMEDABAD

StudentName : Patel Mihir Maheshkumar

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MobileNo : 8128661854

Discipline : BE

Email : mihirpatel121997@gmail.com

Semester : Semester 7

PPR Details

Periodic Progress Report : Fourth PPR

Project : Calorie Intake Detection and Guide to Food

Status : Submitted

1. What Progress you have made in the Project ?

As the final step, only layout is left to be completed for our Android application. We have started making a uniform layout for the app. This layout will be used as a first step towards our full-fledged app at the end of the project.

2. What challenge you have faced ?

Making a uniform and at the same and user friendly layout is not an easy task. And this is the challenge for us that how we make an app that is easy to use and attractive.

3. What support you need ?

Any tool that helps to reduce the effort of making a layout without compromising our goals.

4. Which literature you have referred ?

We referred this website "<https://developer.android.com/training/basics/firstapp/>" for android app development by Google itself.



GUJARAT TECHNOLOGICAL UNIVERSITY
(GTU)
INNOVATION COUNCIL (GIC)
Patent Search & Analysis Report
(PSAR)



Date of Submission : 04/09/2018

Dear Patel Anuj Narendrakumar,

Studied Patent Number for generation of PSAR : 18BET_150280116067_1

PART 1: PATENT SEARCH DATABASE USED

1. Patent Search Database used : Google Patents
- Web link of database : <https://patents.google.com/>
2. Keywords Used for Search : scan,food,calorie,detection
3. Search String Used : scan food calorie detection
4. Number of Results/Hits getting : 4084

PART 2: BASIC DATA OF PATENTED INVENTION /BIBLIOGRAPHIC DATA

5. Category/ Field of Invention :
6. Invention is Related to/Class of Invention : Digital computing or data processing equipment or methods, specially adapted for specific applicatio
- 6 (a) : IPC class of the studied patent : G09B 19/00
7. Title of Invention : Smart Watch and Human-to-Computer Interface for Monitoring Food Consumption
8. Patent No. :
9. Application Number : 13/901,113
- 9 (a) : Web link of the studied patent : <https://patents.google.com/patent/US20140349256A1/en?q=scan&q=food&q=calorie&q=detection&oq=scan+food+calorie+detection>
10. Date of Filing/Application (DD/MM/YYYY) : 05/23/2013
11. Priority Date (DD/MM/YYYY) :
12. Publication/Journal Number :
13. Publication Date (DD/MM/YYYY) :
14. First Filled Country : Albania

15. Also Published as

Sr.No	Country Where Filed	Application No./Patent No.
1		

16. Inventor/s Details.

Sr.No	Name of Inventor	Address/City/Country of Inventor
1	Robert A Connor	Forest Lake

17. Applicant/Assignee Details.

Sr.No	Name of Applicant/Assignee	Address/City/Country of Applicant
1	Robert A Connor	Forest Lake

18. Applicant for Patent is : Individual

PART 3: TECHNICAL PART OF PATENTED INVENTION**19. Limitation of Prior Technology / Art**

There has been considerable success in the development of devices and methods for automatically monitoring and measuring caloric expenditure. This is especially true of recent advances in increasingly-sophisticated wearable fitness devices for tracking caloric expenditure activities. These devices range from simple pedometers to innovative wearable fitness monitors and exercise-tracking smart watches. Most of these fitness devices include a wearable accelerometer to track body motion. Some such devices also have other wearable sensors that measure heart rate, blood pressure, temperature, electromagnetic signals from the body, and/or other physiological parameters.

20. Specific Problem Solved / Objective of Invention

This invention eases it to monitor food consumption.

21. Brief about Invention

This invention is a device and system for monitoring a person's food consumption comprising: a wearable sensor that automatically collects data to detect probable eating events; a voluntary human-to-computer interface that is used by the person to enter food consumption data wherein the person is prompted to enter food consumption data when an eating event is detected by the wearable sensor; and a data analysis component that analyzes food consumption data to estimate the types and amounts of ingredients, nutrients, and/or calories that are consumed by the person. In an example, the wearable sensor can be part of a smart watch or smart bracelet.

22. Key learning Points

Technology can be used in a useful manner.

23. Summary of Invention

This invention is a device and system for monitoring a person's food consumption.

24. Number of Claims : 20

25. Patent Status : Published Application

26. How much this invention is related with your IDP/UDP?

71 to 90%

27. Do you have any idea to do anything around the said invention to improve it? (Give short note in not more than 500 words)

Any improvement can be a one like--pairing the wearable device with smartphone to use data for further processing.



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Patent Search & Analysis Report
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Date of Submission : 01/10/2018

Dear Patel Anuj Narendrakumar,

Studied Patent Number for generation of PSAR : 18BE7_150280116067_2

PART 1: PATENT SEARCH DATABASE USED

1. Patent Search Database used : Google Patents
- Web link of database : <https://patents.google.com/>
2. Keywords Used for Search : scan,food,calorie,detection
3. Search String Used : scan food calorie detection
4. Number of Results/Hits getting : 4084

PART 2: BASIC DATA OF PATENTED INVENTION /BIBLIOGRAPHIC DATA

5. Category/ Field of Invention :
6. Invention is Related to/Class of Invention : Spectroscopy and 3D Imaging Analysis
- 6 (a) : IPC class of the studied patent : G01N33/02
7. Title of Invention : Caloric Intake Measuring System using Spectroscopic and 3D Imaging Analysis
8. Patent No. :
9. Application Number : 14/132,292
- 9 (a) : Web link of the studied patent : <https://patents.google.com/patent/US20150168365A1/en?q=scan&q=food&q=calorie&q=detection&oq=scan+food+calorie+detection>
10. Date of Filing/Application (DD/MM/YYYY) : 12/18/2013
11. Priority Date (DD/MM/YYYY) :
12. Publication/Journal Number :
13. Publication Date (DD/MM/YYYY) :
14. First Filed Country : Albania



GUJARAT TECHNOLOGICAL UNIVERSITY
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INNOVATION COUNCIL (GIC)
Patent Search & Analysis Report
(PSAR)



Date of Submission : 07/10/2018

Dear Patel Anuj Narendrakumar,

Studied Patent Number for generation of PSAR : 18BE7_150280116067_3

PART 1: PATENT SEARCH DATABASE USED

1. Patent Search Database used : Google Patents
- Web link of database : <https://patents.google.com/>
2. Keywords Used for Search : food,calorie,detection,scan
3. Search String Used : scan food calorie detection
4. Number of Results/Hits getting : 4087

PART 2: BASIC DATA OF PATENTED INVENTION /BIBLIOGRAPHIC DATA

5. Category/ Field of Invention :
6. Invention is Related to/Class of Invention : Recognising scenes under surveillance
- 6 (a) : IPC class of the studied patent : G06K9/228
7. Title of Invention : Wearable Imaging Member and Spectroscopic Optical Sensor for Food Identification and Nutrition Modification
8. Patent No. :
9. Application Number : 14/449,387
- 9 (a) : Web link of the studied patent : <https://patentimages.storage.googleapis.com/28/9e/0c/e97bf847ed3dd2/US20160034764A1.pdf>
10. Date of Filing/Application (DD/MM/YYYY) : 08/01/2014
11. Priority Date (DD/MM/YYYY) :
12. Publication/Journal Number :
13. Publication Date (DD/MM/YYYY) :
14. First Filled Country : Albania

15. Also Published as

Sr.No	Country Where Filed	Application No./Patent No.
1		

16. Inventor/s Details.

Sr.No	Name of Inventor	Address/City/Country of Inventor
1	Robert A Connor	Forest Lake

17. Applicant/Assignee Details.

Sr.No	Name of Applicant/Assignee	Address/City/Country of Applicant
1	Robert A Connor	Forest Lake

18. Applicant for Patent is : Individual

PART 3: TECHNICAL PART OF PATENTED INVENTION**19. Limitation of Prior Technology / Art**

This patent application is: (a) a continuation in part of U.S. patent application Ser. No. 13/523,739 by Robert A. Connor entitled "The Willpower WatchTM: A Wearable Food Consumption Monitor filed on Jun. 14, 2012; and is also (b) a continuation in part of U.S. patent application Ser. No. 13/901,099 by Robert A. Connor entitled "Smart Watch and Food-Imaging Member for Monitoring Food Consumption' filed on May 23, 2013, which claimed the priority benefit of: U.S. provisional patent application No. 61/813,780 by Robert A. Connor entitled "Smart Watch that Measures Food Consumption' filed on Apr. 19, 2013; and U.S. provisional patent application No. 61/825,007 by Robert A. Connor entitled "Smart Watch and Food-Imaging Member for Monitoring Food Consumption filed on May 18, 2013. The entire contents of these related applications are incorporated herein by reference.

20. Specific Problem Solved / Objective of Invention

Better diet can be planned using this invention.

21. Brief about Invention

This invention is a wearable device or system for identification and quantification of food comprising an imaging member (such as a camera) that takes pictures of nearby food, an optical sensor (such as a spectroscopic optical sensor) which collects data concerning light that is reflected from this food, an attachment mechanism (such as a wrist band), and an image-analyzing member (such as a data control unit). This invention can further comprise a computer-to-human interface which modifies a person's nutritional intake based on identification of unhealthy vs. healthy food.

22. Key learning Points

Easy to use invention by inventor.

23. Summary of Invention

This invention can be embodied as a wearable device or system for identification and quantification of food, ingredients, and/or nutrients. In an example, this invention can comprise: (a) at least one imaging member (such as a camera) that takes pictures of nearby food, wherein these food pictures are automatically analyzed to identify the types and quantities of food, ingredients, and/or nutrients; (b) an optical sensor (such as a spectroscopic optical sensor) which collects data concerning light that is reflected from nearby food, wherein this data is automatically analyzed to identify types of food, ingredients in the food, and/or nutrients in the food; (c) an attachment mechanism (such as a wrist band) which holds the imaging member and the optical sensor in close proximity to the surface of a person's body; and (d) an image-analyzing member (such as a data control unit).

24. Number of Claims : 20

25. Patent Status : Published Application

26. How much this invention is related with your IDP/UDP?

< 70 %

27. Do you have any idea to do anything around the said invention to improve it? (Give short note in not more than 500 words)

After making prototype some more functionalities can be added.



GUJARAT TECHNOLOGICAL UNIVERSITY
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Patent Search & Analysis Report
(PSAR)



Date of Submission : 09/10/2018

Dear Patel Anuj Narendrakumar,

Studied Patent Number for generation of PSAR : 18BE7_150280116067_4

PART 1: PATENT SEARCH DATABASE USED

1. Patent Search Database used : Google Patents
Web link of database : <https://patents.google.com/>
2. Keywords Used for Search : food,calorie,detection,image, processing
3. Search String Used : food calorie detection image processing
4. Number of Results/Hits getting : 6717

PART 2: BASIC DATA OF PATENTED INVENTION /BIBLIOGRAPHIC DATA

5. Category/ Field of Invention :
6. Invention is Related to/Class of Invention : Nutrition
- 6 (a) : IPC class of the studied patent : G09B19/0092
7. Title of Invention : Food recognition using visual analysis and speech recognition
8. Patent No. :
9. Application Number : 12/683,124
- 9 (a) : Web link of the studied patent : <https://patentimages.storage.googleapis.com/bc/22/f0/44c2298e42a1bb/US20100173269A1.pdf>
10. Date of Filing/Application (DD/MM/YYYY) : 01/06/2010
11. Priority Date (DD/MM/YYYY) :
12. Publication/Journal Number :
13. Publication Date (DD/MM/YYYY) :
14. First Filled Country : Albania

15. Also Published as

Sr.No	Country Where Filed	Application No./Patent No.
1		

16. Inventor/s Details.

Sr.No	Name of Inventor	Address/City/Country of Inventor
1	Manika Puri	Fremont
2	Zhiwei Zhu	CA
3	Jeffrey Lubin	US
4	Tom Pschar	Plainsboro
5	Ajay Divakaran	NJ
6	Harpreet S Sawhney	US

17. Applicant/Assignee Details.

Sr.No	Name of Applicant/Assignee	Address/City/Country of Applicant
1	Manika Puri	Fremont
2	Zhiwei Zhu	CA

18. Applicant for Patent is : Company

PART 3: TECHNICAL PART OF PATENTED INVENTION**19. Limitation of Prior Technology / Art**

Studies have shown that a healthy diet can significantly reduce the risk of disease. This may provide a motivation, either self-initiated or from a doctor, to monitor and assess dietary intake in a systematic way. It is known that individuals do a poor job of assessing their true dietary intake. In the kitchen when preparing a meal, one can estimate the total caloric content of a meal by looking at food labels and calculating portion size, given a recipe of amounts of ingredients. At a restaurant, estimating caloric content of a meal is more difficult. A few restaurants may list in their menus the calorie value of certain low fat/dietary conscience meals, but the majority of meals are much higher in calories, so they are not listed. Even dieticians need to perform complex lab measurements to accurately assess caloric content of foods.

20. Specific Problem Solved / Objective of Invention

What would be desirable, but has not yet been provided, is a system and method for effective and automatic food recognition for large numbers of food types and variations under diverse lighting conditions.

21. Brief about Invention

A method and system for analyzing at least one food item on a food plate is disclosed. A plurality of images of the food plate is received by an image capturing device. A description of the at least one food item on the food plate is received by a recognition device. The description is at least one of a voice description and a text description. At least one processor extracts a list of food items from the description; classifies and segments the at least one food item from the list using color and texture features derived from the plurality of images; and estimates the volume of the classified and segmented at least one food item. The processor is also configured to estimate the caloric content of the at least one food item.

22. Key learning Points

A whole new but related idea is presented in this invention.

23. Summary of Invention

The above-described problems are addressed and a technical solution achieved in the art by providing a method and system for analyzing at least one food item on a food plate, the method being executed by at least one processor, comprising the steps of receiving a plurality of images of the food plate; receiving a description of the at least one food item on the food plate; extracting a list of food items from the description;

classifying and segmenting the at least one food item from the list using color and texture features derived from the plurality of images; and estimating the volume of the classified and segmented at least one food item. The system and method may be further configured for estimating the caloric content of the at least one food item. The description may be at least one of a voice description and a text description. The system and method may be further configured for profiling at least one of the user and meal to include at least one food item not input during the step of receiving a description of the at least one food item on the food plate.

24. Number of Claims : 42

25. Patent Status : Granted Patent & In-force Patent

26. How much this invention is related with your IDP/UDP?

< 70 %

27. Do you have any idea to do anything around the said invention to improve it? (Give short note in not more than 500 words)

No



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Patent Search & Analysis Report
(PSAR)



Date of Submission : 09/10/2018

Dear Patel Anuj Narendrakumar,

Studied Patent Number for generation of PSAR : 18BE7_150280116067_5

PART 1: PATENT SEARCH DATABASE USED

1. Patent Search Database used : Google Patents
Web link of database : <https://patents.google.com/>
2. Keywords Used for Search : food,calorie,detection,image, processing
3. Search String Used : food calorie detection image processing
4. Number of Results/Hits getting : 6717

PART 2: BASIC DATA OF PATENTED INVENTION /BIBLIOGRAPHIC DATA

5. Category/ Field of Invention :
6. Invention is Related to/Class of Invention : Extraction of features or characteristics of the image related to colour
- 6 (a) : IPC class of the studied patent : G06K9/4652
7. Title of Invention : Real-time diet assessment and food identification using thermal imaging
8. Patent No. :
9. Application Number : US10074028B2
- 9 (a) : Web link of the studied patent : <https://patentimages.storage.googleapis.com/12/c4/5e/9b1fec02eefd37/US10074028.pdf>
10. Date of Filing/Application (DD/MM/YYYY) : 10/20/2016
11. Priority Date (DD/MM/YYYY) :
12. Publication/Journal Number :
13. Publication Date (DD/MM/YYYY) :
14. First Filed Country : Albania :

15. Also Published as

Sr.No	Country Where Filed	Application No./Patent No.
1		

16. Inventor/s Details.

Sr.No	Name of Inventor	Address/City/Country of Inventor
1	Sandeep Gupta	Phoenix
2	Ayan Banerjee	AZ

17. Applicant/Assignee Details.

Sr.No	Name of Applicant/Assignee	Address/City/Country of Applicant
1	Sandeep Gupta	Phoenix
2	Ayan Banerjee	AZ

18. Applicant for Patent is : College

PART 3: TECHNICAL PART OF PATENTED INVENTION**19. Limitation of Prior Technology / Art**

Previous technology was not helping.

20. Specific Problem Solved / Objective of Invention

Diet monitoring is an important intervention factor in obesity, which affects over one-third of US adults. Some obesity research has shown that dietary monitoring can significantly help people lose weight. Automated diet monitoring and caloric intake prediction might also provide an effective intervention for chronic diseases such as obesity and diabetes that affect nearly one-third of US adults with a combined estimated economic cost of \$392 Billion.

21. Brief about Invention

Systems and methods are described for automatically identifying a food item. A color image and a thermal image are received by an electronic processor with a first food item in the field of view of both the color image and the thermal image. The electronic processor identifies a region of pixels in the color image that corresponds to the first food item based at least in part on a temperature intensity of the pixels in the identified region of pixels relative to other pixels in the thermal image. At least one feature is extracted from the identified region of pixels in the color image corresponding to the first food item and the electronic processor automatically identifies a type of food corresponding to the first food item based at least in part on the at least extracted feature.

22. Key learning Points

Some inventions are necessity at certain point of time.

23. Summary of Invention

Diet is an important factor in obesity, which affects over one third of US adults. Some obesity research has shown that dietary monitoring can significantly help people lose weight. Self-monitoring techniques for diet, such as manual paper-based records (food diaries) and 24-hour dietary recalls that assess the amount and type of food eaten, might be helpful. However, these techniques suffer from three important drawbacks: a) adherence to self-monitoring for the prescribed period of intervention is low (nearly 63%), b) self-reporting is prone to underreporting, especially in individuals with obesity by amounts ranging from 20%-50%, and c) recall error while reporting food intake. Further, in self-reported dietary assessment, where a 0.5 to 0.7 correlation with actual intake would be considered good; many studies have found a 0.4 correlation with self-reported dietary assessment and intake. The misclassification of caloric intake and nutrient profiles tends to be differential based on weight status and/or overall energy intake. Moreover, after a weight loss program involving diet self-monitoring there is a high rate of relapse.

24. Number of Claims : 18

25. Patent Status : Granted Patent & In-force Patent

26. How much this invention is related with your IDP/UDP?

< 70 %

27. Do you have any idea to do anything around the said invention to improve it? (Give short note in not more than 500 words)

Some improvements may be possible which can enhance invention.



GUJARAT TECHNOLOGICAL UNIVERSITY
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Patent Search & Analysis Report
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Date of Submission : 30/08/2018

Dear Patel Mihir Maheshkumar,

Studied Patent Number for generation of PSAR : 18BET_150280116076_1

PART 1: PATENT SEARCH DATABASE USED

1. Patent Search Database used : Google Patents
Web link of database : <https://patents.google.com/>
2. Keywords Used for Search : calorie,detection,food,images,machine learning
3. Search String Used : calorie detection food images machine learning
4. Number of Results/Hits getting : 873

PART 2: BASIC DATA OF PATENTED INVENTION /BIBLIOGRAPHIC DATA

5. Category/ Field of Invention :
6. Invention is Related to/Class of Invention : Calorie Detection
- 6 (a) : IPC class of the studied patent : G06K9/344
7. Title of Invention : Restaurant-specific food logging from images
8. Patent No. :
9. Application Number : US20150228062A1
- 9 (a) : Web link of the studied patent : <https://patents.google.com/patent/US20150228062A1/en?q=calorie&q=detection&q=food&q=images&q=machine+learning>
10. Date of Filing/Application (DD/MM/YYYY) : 08/13/2015
11. Priority Date (DD/MM/YYYY) : 02/12/2014
12. Publication/Journal Number :
13. Publication Date (DD/MM/YYYY) :
14. First Filed Country : Albania :

15. Also Published as

Sr.No	Country Where Filed	Application No./Patent No.
1		

16. Inventor/s Details.

Sr.No	Name of Inventor	Address/City/Country of Inventor
1	Neel Suresh Joshi	USA
2	Siddharth khullar	USA
3	T Scott Saponas	USA
4	Daniel Morris	USA
5	Oscxar Beijbom	USA

17. Applicant/Assignee Details.

Sr.No	Name of Applicant/Assignee	Address/City/Country of Applicant
1	Microsoft Technology Licensing LLC	USA

18. Applicant for Patent is : Company

PART 3: TECHNICAL PART OF PATENTED INVENTION**19. Limitation of Prior Technology / Art**

Prior to this technology, one has to use laboratory's equipments and environment as this used to need specific machines. But, after this this has been resolved and now any one can know nutrients in his meal by just taking a photo.

20. Specific Problem Solved / Objective of Invention

Easy detection and specification of the food being captured as an image along with nutrients information regarding the same. Machine is able to detect whatever there is in the picture by processing that picture with an algorithm.

21. Brief about Invention

A "Food Logger" provides various approaches for learning or training one or more image-based models of nutritional content of meals. This training is based on one or more datasets of images of meals in combination with "meal features" that describe various parameters of the meal. Examples of meal features include, but are not limited to, food type, meal contents, portion size, nutritional content (e.g., calories, vitamins, minerals, carbohydrates, protein, salt, etc.), food source (e.g., specific restaurants or restaurant chains, grocery stores, particular pre-packaged foods, school meals, meals prepared at home, etc.). Given the trained models, the Food Logger automatically provides estimates of nutritional information based on automated recognition of new images of meals provided by (or for) the user. This nutritional information is then used to enable a wide range of user-centric interactions relating to food consumed by individual users.

22. Key learning Points

Brief of image processing and all other aspects regarding the detection of the nutrients from food picture.

23. Summary of Invention

Extracting nutrition information from a food pic from different categories and places.

24. Number of Claims : 21

25. Patent Status : Granted Patent & In-force Patent

26. How much this invention is related with your IDP/UDP?

71 to 90%

27. Do you have any idea to do anything around the said invention to improve it? (Give short note in not more than 500 words)

It can be improved by adding more sophisticated image processing and machine learning algorithms.



GUJARAT TECHNOLOGICAL UNIVERSITY
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Patent Search & Analysis Report
(PSAR)



Date of Submission : 31/08/2018

Dear Patel Mihir Maheshkumar,

Studied Patent Number for generation of PSAR : 18BE7_150280116076_2

PART 1: PATENT SEARCH DATABASE USED

1. Patent Search Database used : Google Patents
Web link of database : <https://patents.google.com/>
2. Keywords Used for Search : calorie,detection,food,images,machine learning
3. Search String Used : calorie detection food images machine learning
4. Number of Results/Hits getting : 394

PART 2: BASIC DATA OF PATENTED INVENTION /BIBLIOGRAPHIC DATA

5. Category/ Field of Invention :
6. Invention is Related to/Class of Invention : Calorie Detection
- 6 (a) : IPC class of the studied patent : G06K9/6202
7. Title of Invention : Automated Food Recognition and Nutritional Estimation With a Personal Mobile Electronic Device
8. Patent No. :
9. Application Number : US20160063734A1
- 9 (a) : Web link of the studied patent : <https://patents.google.com/patent/US20160063734A1/en?q=calorie&q=detection&q=food&q=images&q=machine+learning&oq=calorie+detection+food+images+machine+learning>
10. Date of Filing/Application (DD/MM/YYYY) : 12/11/2014
11. Priority Date (DD/MM/YYYY) :
12. Publication/Journal Number :
13. Publication Date (DD/MM/YYYY) :
14. First Filed Country : Albania

15. Also Published as

Sr.No	Country Where Filed	Application No./Patent No.
1		

16. Inventor/s Details.

Sr.No	Name of Inventor	Address/City/Country of Inventor
1	Ajay Divakaran	SRI international
2	Weiyu Zhang	SRI International
3	Qian Yu	SRI International
4	Harpreeet S Sawhney	SRI International

17. Applicant/Assignee Details.

Sr.No	Name of Applicant/Assignee	Address/City/Country of Applicant
1	SRI International	USA

18. Applicant for Patent is : Company

PART 3: TECHNICAL PART OF PATENTED INVENTION**19. Limitation of Prior Technology / Art**

Prior to this technology, the detection of calorie and other nutrients from food pics was dependant on sophisticated equipments, generally found in high tech laboratories.

20. Specific Problem Solved / Objective of Invention

Knowledge of nutrients in food becomes easy as only a mobile device is necessary and can be done by just taking a picture of the food.

21. Brief about Invention

A food recognition assistant system includes technologies to recognize foods and combinations of foods depicted in a digital picture of food. Some embodiments include technologies to estimate portion size and calories, and to estimate nutritional value of the foods. In some embodiments, data identifying recognized foods and related information are generated in an automated fashion without relying on human assistance to identify the foods. In some embodiments, the system includes technologies for achieving automatic food detection and recognition in a real-life setting with a cluttered background, without the images being taken in a controlled lab setting, and without requiring additional user input (such as user-defined bounding boxes). Some embodiments of the system include technologies for personalizing the food classification based on user-specific habits, location and/or other criteria.

22. Key learning Points

Brief of image processing and all other aspects regarding the detection of the nutrients from food picture.

23. Summary of Invention

Extracting nutrition information from a food pic from different categories and places.

24. Number of Claims : 20

25. Patent Status : Granted Patent & In-force Patent

26. How much this invention is related with your IDP/UDP?

71 to 90%

27. Do you have any idea to do anything around the said invention to improve it? (Give short note in not more than 500

words)

It can be improved by adding more sophisticated image processing and machine learning algorithms.



GUJARAT TECHNOLOGICAL UNIVERSITY
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Patent Search & Analysis Report
(PSAR)



Date of Submission : 31/08/2018

Dear Patel Mihir Maheshkumar,

Studied Patent Number for generation of PSAR : 18BE7_150280116076_3

PART 1: PATENT SEARCH DATABASE USED

1. Patent Search Database used : Google Patents
- Web link of database : <https://patents.google.com/>
2. Keywords Used for Search : calorie,detection,food,images
3. Search String Used : calorie detection from food images
4. Number of Results/Hits getting : 5724

PART 2: BASIC DATA OF PATENTED INVENTION /BIBLIOGRAPHIC DATA

5. Category/ Field of Invention :
6. Invention is Related to/Class of Invention : Calorie Detection
- 6 (a) : IPC class of the studied patent : A61B5/742
7. Title of Invention : Systems and methods for measuring calorie intake
8. Patent No. :
9. Application Number : US20150294450A1
- 9 (a) : Web link of the studied patent : <https://patents.google.com/patent/US20150294450A1/en?q=calorie&q=detection&q=food&q=images&oq=calorie+detection+from+food+images+&page=4>
10. Date of Filing/Application (DD/MM/YYYY) : 10/15/2015
11. Priority Date (DD/MM/YYYY) : 04/15/2014
12. Publication/Journal Number :
13. Publication Date (DD/MM/YYYY) :
14. First Filled Country : Albania

15. Also Published as

Sr.No	Country Where Filed	Application No./Patent No.
1		

16. Inventor/s Details.

Sr.No	Name of Inventor	Address/City/Country of Inventor
1	Matthew J Eyering	Vivint Inc.

17. Applicant/Assignee Details.

Sr.No	Name of Applicant/Assignee	Address/City/Country of Applicant
1	Vivic Inc	USA

18. Applicant for Patent is : Company

PART 3: TECHNICAL PART OF PATENTED INVENTION**19. Limitation of Prior Technology / Art**

Need for heavy equipments to detect calorie from images.

20. Specific Problem Solved / Objective of Invention

Easy to implement on any processing device having a display.

21. Brief about Invention

Systems and methods for measuring calorie input are described. A calorie measure may be maintained. At least one image of a food item may be captured. The at least one image of the food item may be transmitted to a server. A calories consumed value may be received from the server. The calories consumed value may be determined based at least in part on the at least one image of the food item. The calorie measure may be updated based on the received calories consumed value.

22. Key learning Points

Device needed. Image processing

23. Summary of Invention

A computer-implemented method for measuring calorie input.

24. Number of Claims : 20

25. Patent Status : Applied Patent

26. How much this invention is related with your IDP/UDP?

71 to 90%

27. Do you have any idea to do anything around the said invention to improve it? (Give short note in not more than 500 words)

I think this is perfect match for our project.



GUJARAT TECHNOLOGICAL UNIVERSITY
(GTU)
INNOVATION COUNCIL (GIC)
Patent Search & Analysis Report
(PSAR)



Date of Submission : 31/08/2018

Dear Patel Mihir Maheshkumar,

Studied Patent Number for generation of PSAR : 18BE7_150280116076_4

PART 1: PATENT SEARCH DATABASE USED

1. Patent Search Database used : Google Patents
Web link of database : <https://patents.google.com/>
2. Keywords Used for Search : calorie,detection,food,images
3. Search String Used : calorie detection from food images
4. Number of Results/Hits getting : 5724

PART 2: BASIC DATA OF PATENTED INVENTION /BIBLIOGRAPHIC DATA

5. Category/ Field of Invention :
6. Invention is Related to/Class of Invention : Calorie Detection
- 6 (a) : IPC class of the studied patent : A61B5/4866
7. Title of Invention : Method and system for automatically identifying caloric intake and consumption through mobile equipment
8. Patent No. :
9. Application Number : CN107493390A
- 9 (a) : Web link of the studied patent : <https://patents.google.com/?inventor=%E8%B4%BE%E5%B0%8F%E4%BA%91>
10. Date of Filing/Application (DD/MM/YYYY) : 12/19/2017
11. Priority Date (DD/MM/YYYY) : 09/01/2017
12. Publication/Journal Number :
13. Publication Date (DD/MM/YYYY) :
14. First Filled Country : Albania

15. Also Published as

Sr.No	Country Where Filed	Application No./Patent No.
1		

16. Inventor/s Details.

Sr.No	Name of Inventor	Address/City/Country of Inventor
1	Jia Xiaoyun	Shaanxi University of Science and Technology
2	Wang Xing	Shaanxi University of Science and Technology
3	Wang Erhu	Shaanxi University of Science and Technology

17. Applicant/Assignee Details.

Sr.No	Name of Applicant/Assignee	Address/City/Country of Applicant
1	Shaanxi University of Science and Technology	China

18. Applicant for Patent is : University

PART 3: TECHNICAL PART OF PATENTED INVENTION**19. Limitation of Prior Technology / Art**

Prior to this technology, the detection of calorie and other nutrients from food pics was dependant on sophisticated equipments, generally found in high tech laboratories.

20. Specific Problem Solved / Objective of Invention

Knowledge of nutrients in food becomes easy as only a mobile device is necessary and can be done by just taking a picture of the food. Also, it gives suggestion of whether to eat particular food as per your diet or not.

21. Brief about Invention

The invention discloses a method and system for automatically identifying caloric intake and consumption through mobile equipment. The method comprises the following steps: performing image identification on an intake picture to estimate the total caloric of the current food, suggesting whether to eat and the edible amount according to user information; detecting an eating action, computing to acquire the first caloric and the ready-to-eat food amount at present; when detecting the stopping of the eating, computing the second caloric and saving the current remained food amount; acquiring the intake food caloric according to the first caloric, the second caloric, the ready-to-eat food amount and the remained food amount, thereby providing a corresponding prompt; acquiring exercise data to obtain the consumed caloric; performing conversion on the consumed caloric according to the food information, outputting a result and giving a suggestion; providing a corresponding food plan and suggestion, and reminding a user. The method and system disclosed by the invention can help the user to understand the contained caloric and the consumption way and time of the ready-to-eat food, can help the user to detect the caloric of the eaten and consumed food at any time, and can help the user to reasonably control the diet according to the user information.

22. Key learning Points

Detecting of calorie, suggestion of whether to eat or not and what to eat as per person's diet.

23. Summary of Invention

Getting calorie from food pics and suggesting food as per diet.

24. Number of Claims : 10

25. Patent Status : Applied Patent

26. How much this invention is related with your IDP/UDP?

< 70 %

27. Do you have any idea to do anything around the said invention to improve it? (Give short note in not more than 500 words)

I don't think so.



GUJARAT TECHNOLOGICAL UNIVERSITY
(GTU)
INNOVATION COUNCIL (GIC)
Patent Search & Analysis Report
(PSAR)



Date of Submission : 30/09/2018

Dear Patel Mihir Maheshkumar,

Studied Patent Number for generation of PSAR : 18BE7_150280116076_5

PART 1: PATENT SEARCH DATABASE USED

1. Patent Search Database used : Google Patents
Web link of database : <https://patents.google.com/>
2. Keywords Used for Search : calorie,detection,food,image processing,machine learning
3. Search String Used : calorie detection food image processing machine learning
4. Number of Results/Hits getting : 964

PART 2: BASIC DATA OF PATENTED INVENTION /BIBLIOGRAPHIC DATA

5. Category/ Field of Invention :
6. Invention is Related to/Class of Invention : Calorie Estimation
- 6 (a) : IPC class of the studied patent : G09B19/0092
7. Title of Invention : Portable terminal, calorie estimation method, and calorie estimation program
8. Patent No. :
9. Application Number : JP2012113627A
- 9 (a) : Web link of the studied patent : <https://patents.google.com/patent/JP2012113627A/en?q=calorie&q=detection&q=food&q=image&q=processing&q=machine+learning&q=calorie+detection+food+image+processing+machine+learning>
10. Date of Filing/Application (DD/MM/YYYY) : 06/14/2012
11. Priority Date (DD/MM/YYYY) : 11/26/2010
12. Publication/Journal Number :
13. Publication Date (DD/MM/YYYY) :
14. First Filled Country : Albania

15. Also Published as

Sr.No	Country Where Filed	Application No./Patent No.
1		

16. Inventor/s Details.

Sr.No	Name of Inventor	Address/City/Country of Inventor
1	Koji Nakao	Japan

17. Applicant/Assignee Details.

Sr.No	Name of Applicant/Assignee	Address/City/Country of Applicant
1	Terumo Corp	Japan

18. Applicant for Patent is : Company

PART 3: TECHNICAL PART OF PATENTED INVENTION**19. Limitation of Prior Technology / Art**

Prior to this technology one had to use pre-stored data, including all information regarding food to be detected inside the system so that it can be compared at the time while detecting calorie.

20. Specific Problem Solved / Objective of Invention

After this technique various features of food like color can be used to detect calorie directly without need of separate database for different food.

21. Brief about Invention

This invention detects a dish CT from food image G1 of food captured by an imaging part 15 from an oblique direction, detects a form and color of the dish CT and color of the food served in the dish CT, and estimates the food and its calorie based on the form and the color of the detected dish CT and the color of the food using food estimation database DB. Therefore, the food and its calorie can be estimated with a reduced processing load and a small amount of data without forcing a user to perform complicated operation.

22. Key learning Points

Features like shape of vessel and color of food can be used to detect calorie from food pics.

23. Summary of Invention

Calorie detection from food images using features like color of food and shape of vessel for particular type of food.

24. Number of Claims : 8

25. Patent Status : Applied Patent

26. How much this invention is related with your IDP/UDP?

< 70 %

27. Do you have any idea to do anything around the said invention to improve it? (Give short note in not more than 500 words)

Not only color but other features like shape, size(for example pizza), country of origin can also be used to detect calorie.