

**CSE 499.11**

**Senior Design**

**Project Report**

**Of**

**Food Recognition And Calorie Estimation Using Image  
Processing**

**Submitted by,**

<b>Name</b>	<b>ID</b>
<b>Jahid Hasan</b>	<b>1620975042</b>
<b>Ismail Bin Suhrwardy</b>	<b>1812628042</b>
<b>Md. Sabbir Hossain</b>	<b>1821101042</b>

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## Abstract

As people across the globe are becoming more concerned in watching their weight, eating more healthy and avoiding obesity, a system that can measure calories in everyday meals can be very useful. Obesity treatment requires constant monitoring and a rigorous control of diet, thus it is necessary to measure daily calorie intake. Therefore, measuring food intake each day is considered an important step in the success of a healthy diet. The food calorie measurement system can help patients and dietitians to measure and manage daily food calorie intake. This system is built on food image processing via a special calibration technique, the system records a photo of the food to measure the consumption of calorie components. The input is the food image. The system then processes and classifies the images to detect the type of food, then uses the information to estimate the number of calories in the food. The calculation of the amount of calories in the image is an essential step in our system.

## INTRODUCTION

Food is the key of human's body. So, a diet plan always needs to take into consideration the total number of calories to be consumed to maintain a fit and healthy life. But, in most cases, unfortunately people face difficulties in estimating and measuring the amount of food intake due to the mainly lack of nutritional information, which includes manual process of writing down this information, and other reasons. As such, it will be useful if there is a system to keep track and maintain the calorie intake. In the last three years, object classification and detection capabilities have dramatically improved due to advances in deep learning and convolutional neural networks. Food image recognition provides an easy means to estimate the dietary caloric intake and evaluate people's eating habits, by using cameras to stay track of their food consumption. An accurate estimation of daily nutritional intake provides a useful solution for keeping healthy and to prevent diseases.

## **Why it is important**

This will help those who are highly health conscious. Our users will be able to know the calorie of a food just by uploading an image. Every time while eating if they want to know that how much calorie they are consuming this will be beneficial for them. It will certainly help the users to maintain a good diet.

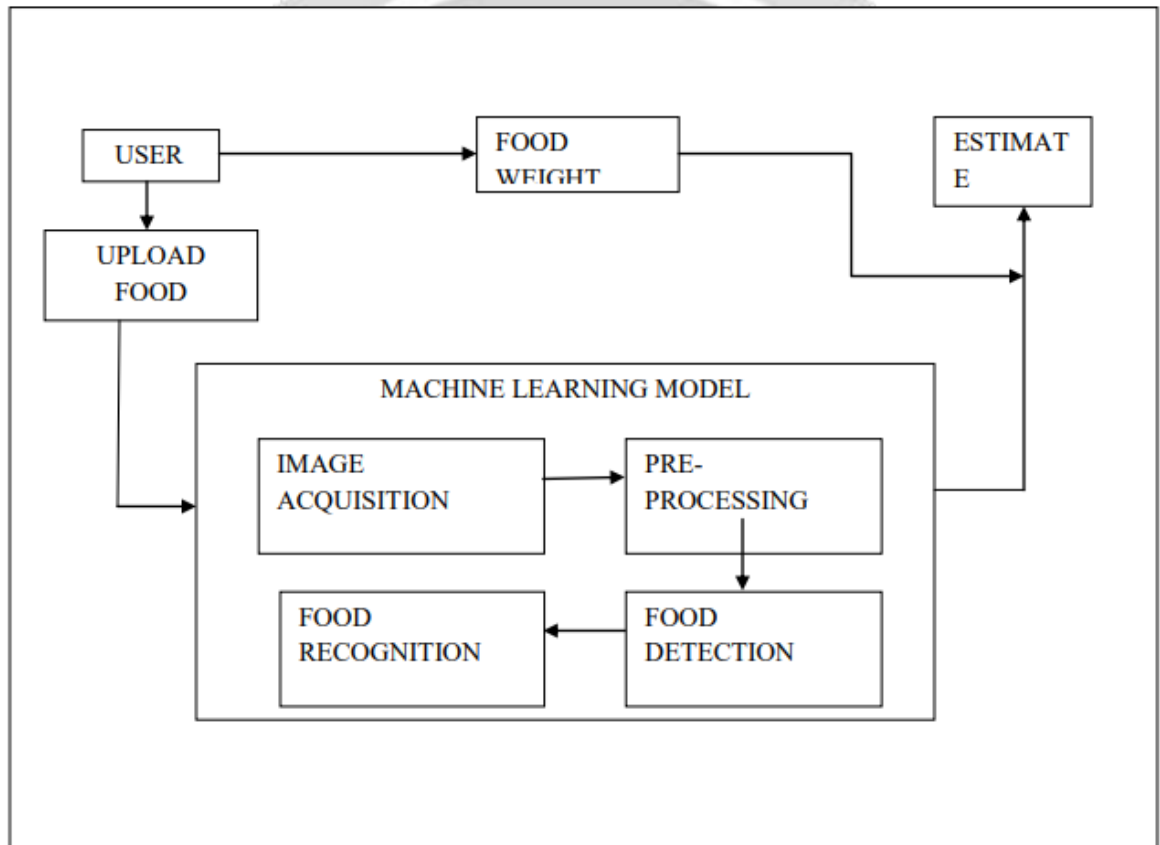
## **Solution**

We have to manually create a dataset by collecting different types of food item images and their corresponding calories. We will collect 50-60 types of food images although it can vary later depending upon data availability. Then we will create a robust and reliable deep learning model that will help us to detect certain food images. After that we will build a web application using that model to show calorie of a food item uploaded by the user.

## **PROPOSED SYSTEM**

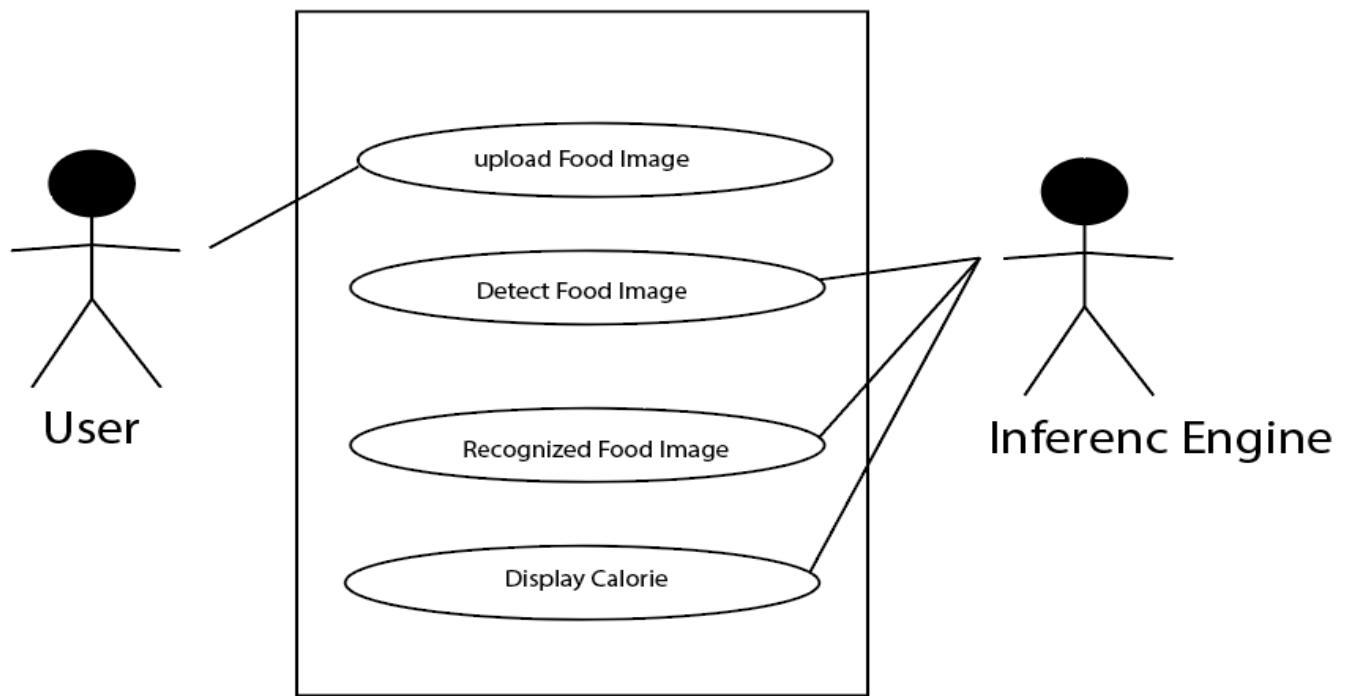
The main idea of our project is to create a web-based system which will be powered by deep learning that will allow our users to know the calorie of a certain food item just by uploading a picture of it. We will first collect a good amount of food images that will be our dataset. Then we will build a model by training on this dataset. Once our final model is ready we will integrate this model into a web application. Our web application will take a single image from the user as input. This will detect which food it is and show the calorie of the food as well.

## Architecture diagram



**Fig-1: Architecture Diagram**

## Use case Diagram



**Fig 02 : use case diagram**

## **CHALLENGES**

# Recognizing the food item with the help of single picture

#Dataset becomes much larger when it comes on food images, so currently we are going to take a finite dataset for training

## **Tools**

**Language- Python**

**DL framework- Tensorflow**

**Web framework- Django**

## **Publication:**

Currently we don't have any intention of publishing our work.

## **FUTURE SCOPE**

- The web application can be converted into mobile app for more user convenience
- More categories of food can be trained in future
- Multiple layers in single food item can be recognized
- Calorie can be estimated with the help of volume

## **CONCLUSIONS**

Our final and end goal is to create a nice web application for the user that will be easy to use and backed by a fine-tuned deep learning model. We can expect it will surely help our society to maintain a healthy diet.