

# FussyFood: An Application to Navigate Food Allergies & Dietary Restrictions

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April 30, 2015

## 1 Introduction

In this project, we propose to create a phone application which allows the user to make informed decisions about an edible product using an image of its ingredient list. For instance, it is estimated that 43–72 million people suffer from peanut allergies. Approximately 11 million people in America follow a vegetarian diet. Such instances demonstrate that large populations in the world need to make informed decisions regarding their diet due to a variety of restrictions.

We want to make an application in which a user can take an image of the ingredients and receive a quick feedback informing them whether the product aligns with their dietary needs. Such an application is even more critical to users when they are unfamiliar with the ingredients listed – for instance, a person with dietary restrictions traveling to another country where the lingua franca is not one he/she is familiar with might find themselves in dire need for such an application.

## 2 Technical Requirements

Concretely, we want to build this project in phases such that we can add features based on time constraints. The fundamental features will entail a system:

- where a user can indicate his/her dietary restrictions
- that can capture an image using an Android phone
- for cropping the image to restrict input to be only ingredients
- to use an existing OCR engine to detect characters and words
- to query ingredients using an online database
- to return relevant properties of the ingredients to the user

Additionally, we have also compiled a list of features we can consider implementing if time permits:

- Implement our own specialized OCR [1] which detects characters and forms known ingredient words (since a specialized system for this application is likely to perform better than a generic OCR system)
- An automated technique to detect a bounding box for area of interest in an image (i.e. list of ingredients)
- Product identification from product image (and not just ingredient list image)
- Supporting multiple languages (and not just English)

### 3 Engineering Challenges

The main engineering challenges of the project are:

- Pre-processing the image before giving it to OCR [2]: The input image can be skewed, noisy, blurred and therefore we first need to do apply filters and transformations. We also need to segment the image to separate the text part from the rest of the image.
- Optical Character Recognition (OCR): We plan to use existing engine like Tesseract [3] to make the first working model of our project. Then we plan to use traditional machine learning and deep learning techniques to train our own OCR system to work for this specialized application. We have found datasets [4] of synthesized characters from computer fonts that can be used for this purpose
- Application Workflow: We will create an Android application with an interface for user to select his/her dietary restrictions and also where the user can take a photo and see the output. We will attempt to design a very user-friendly workflow to do this.

### References

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