

Dataset

- <http://www.ub.edu/cvub/recipes5k/>
- <https://www.kaggle.com/dansbecker/food-101?select=food-101.zip>
 - A dataset containing 101 different categories of foods such as apple pie, clam chowder, with around 1000 images. We chose this because it contains a good amount of data for many different foods, and seems to be standard for training food related machine learning models.

Methodology

Data Preprocessing

- Data is feasible and consists of images of food sorted into 101 labelled categories with around 1000 images in each category.
- Since the images have different sizes, we will need to crop them to the same size, likely to the same resolution.
- The data should be visualized to see if any categories have substantially more instances than others, in which case we may have to trim it.
- Will have to consider whether using full color data is feasible as it is a lot of data, otherwise must convert each image to grayscale values in $[0,1]$ for each pixel.
- We also need a database of food items and their ingredients (no ML is needed on this dataset, could just be a hashmap or a sql database)

ML Model

The goal of this model is to predict the type of food from an image, thus it will be a classification model. Since we will be using a labelled dataset we will undertake supervised learning. For our project, one of the most important components is image recognition and classification. Hence, we decided to utilise a convolutional neural network, as they are often used for visual data.

Evaluation Metric

Since we are going to be utilising a classification model we will be reporting using a confusion matrix and accuracy/precision-recall/logistic loss.

Application

We could build a mobile application that allows the user to take a picture of a dish and the app will use the image (send to the backend) to classify the image and determine the food. Then, it will search the food in its database to determine its ingredients.