

EE368 Project Proposal

Automatic Grocery Shopping Assistant

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The project will be implemented on an android phone.

Motivation

Automatic food recognition is emerging as an important topic due to the increasing demand for better dietary and nutritional assessment tools. The goal of the project is to create an Android application that allows the user to plan a more balance diet while grocery shopping. When a user buys an item for the first time, he or she needs to take an image of the item's package containing ingredient and nutritional information. This app will record this item's name, nutrients and calories, therefore gradually establishing a database for some common food items the person tends to purchase. In the future, the user just need to take a photo of the shopping cart or conveyor belt at the checkout station of the supermarket and the app will recognize each item and list the corresponding calories, composition and the ingredients to help the user plan a healthier lifestyle.

Approach

1. The first step is to establish a connection from the android to the server. For each photo taken by android's camera, the system uploads the image to the server for further processing. The server will return processed information back to the droid phone.
2. Using images of the portion of product packaging that contains nutritional information, we try to extract nutritional information written. This information is stored in the database.
3. Using images of the food product from different angles (these images constitutes the training set), we extract the general shape, brand, and color of a particular product and associates it with the nutritional information extracted from the step above This completes the database entry for one item.
4. Test the app with actual images of the conveyer belt at the supermarket checkout stations. The items will be place far apart to aid the image recognition software.

Challenges

1. Different images of the same food item will have geometrical translation, rotation, and scaling effects (assuming there are no changes in the shape of the actual food item). Thus, we limit the application to only products in well-defined package geometries such as a rectangular cereal box or instant noodle bowls.
2. Lighting conditions could also cause classification errors. We plan to use some normalization techniques before feature extraction.

References

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