The Problem

Background

- Increasing obesity\(^1\) leads to necessity in understanding dietary choices of individuals
- Current electronic food trackers require participants to manually input meal descriptions
  - Difficult for researchers to standardize and analyze.

Current Food Tracker: MealLogger

<table>
<thead>
<tr>
<th>Example Participant Meal Inputs</th>
<th>Researcher Follow-up Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pasta with shrimp</td>
<td>What kind of pasta sauce?</td>
</tr>
<tr>
<td>Stir-fried veggie mix with sausage</td>
<td>What type of veggies and sausage?</td>
</tr>
</tbody>
</table>

Why MealLogger is not ideal:

- Manual input of descriptions by participants may not be detailed
- Inconsistent descriptions and ambiguous sizing difficult for analysis
- No way to keep track of participants’ personal dietary needs and habits

Prototype

Goal

To implement machine learning into a meal tracking phone application to provide an easy and efficient method for both participants and researchers to label and analyze food items in a standardized fashion.

Methodology / Tools

- Turicreate - python module
  - Train a model to identify different types of fruits using a machine learning algorithm
- Xcode/Swift
  - iOS app development using CoreML and Vision modules

Features

- Take photo with automatic labeling of fruits
- Organizes saved data depending on type of fruit present

Next Steps

Future Implementations

- Incorporate with NASA FEAST app
  - FEAST = Food Evaluation and Sample Tracking
  - Record participant caloric intake, home saliva and urine samples
  - Easy access and analysis for researchers

How machine learning will enhance FEAST

- Present potential identities of food found in photo and allow user to select detailed options
  - standardized descriptions
- Questionnaires prompting meal details based on recognized food type (ie: pasta sauce, type of meat)
- Built in model can learn to recognize user repetitive meal combinations (ie: pizza with soda, apple and oatmeal, etc.)
  - allow default options that participants can easily choose from
- Teach model to judge amount of food with a business card for reference

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Reference