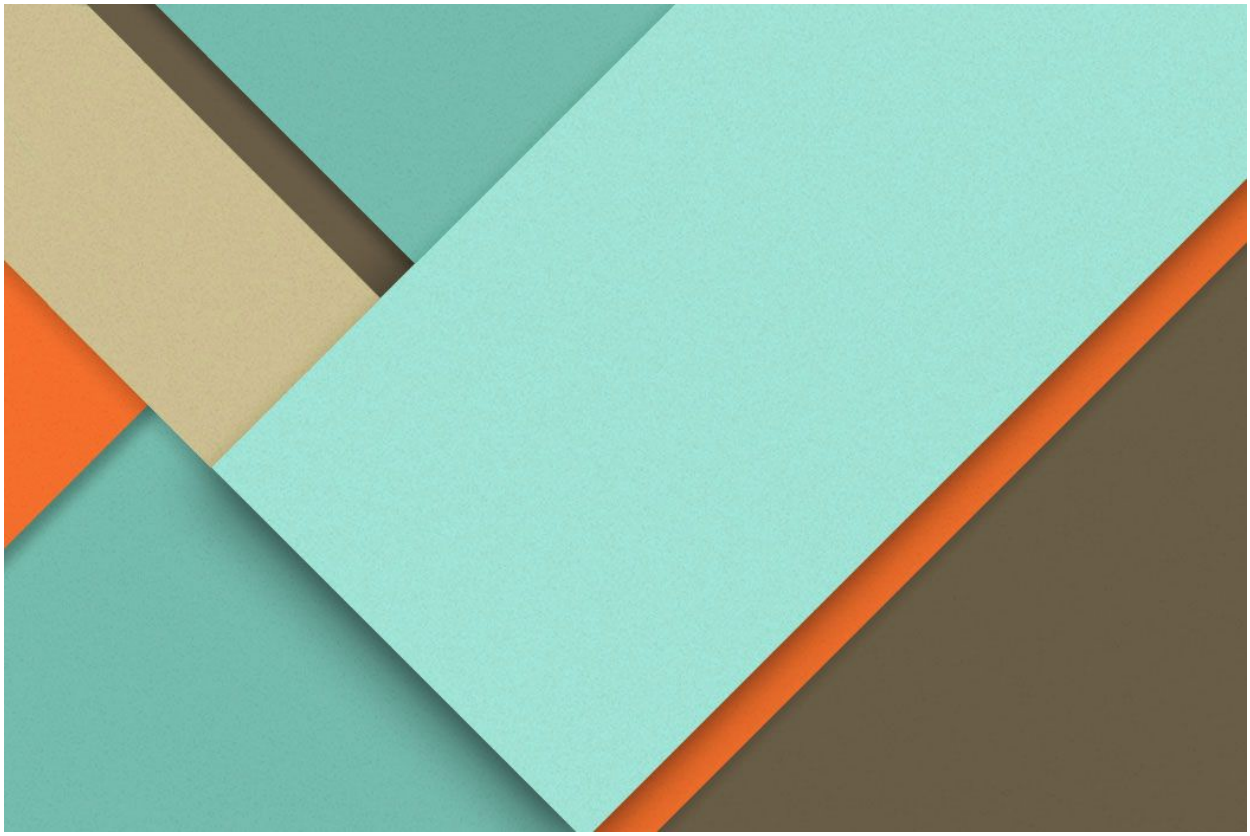

Capstone Project Ideas

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Ky Pham
Springboard AIC, Cohort 02.04.2019
Riverside, CA, USA.

Overview

After studying some datasets freely available, I came up with three ideas I would like for my capstone project. These ideas are listed based on difficult levels.

Idea 1 (CHOSEN AS CAPSTONE PROJECT)

As an immigrant, sometimes I had a hard time to find a talking point when hanging around with new friends, coworkers, and customers. I would like to build a mobile app leveraging the camera to take a picture of foods, drinks, movies, cars, signs, buildings, etc., then using a backend service to recognize it in order to provide interesting facts:

- What is the name
- Brief history: where it came from; when it was first made, etc.
- Who (famous people) have tried (foods/drinks), stared (movies), owned (cars), lived (buildings), etc.

This information can be shown as text on the screen or streamed as speech to earplug so the person can have some ideas to engage a conversation.

The app can be extended to salespersons to personalize welcoming.

Here are some datasets to begin with:

- Foods (https://www.vision.ee.ethz.ch/datasets_extra/food-101/)
  Download: https://s3.amazonaws.com/fast-ai-imageclas/food-101.tgz
- Cars (https://ai.stanford.edu/~jkrause/cars/car_dataset.html):
  Download: https://s3.amazonaws.com/fast-ai-imageclas/stanford-cars.tgz
- Movies (REST API):
  http://www.omdbapi.com

Some ML techniques:

- Classification/Deep Learning: YOLO, Caffe
- Text Summarization (Subject extraction using Google API)
- Text-to-speech generation

How to collect facts:

- Google search "<term> fun facts" and obtain the first match (pressing next button for another down on the list)

Idea 2

Using Amazon/Yelp reviews datasets to implement a product recommendation system to predict what products a specific customer might buy in the near future.

Here are some datasets to begin with:

- Character-level Convolutional Networks for Text Classification: http://xzh.me/docs/charconvnet.pdf
- Amazon Reviews - Full: https://s3.amazonaws.com/fast-ai-nlp/amazon_review_polarity_csv.tgz
- Amazon Reviews - Polarity: https://s3.amazonaws.com/fast-ai-nlp/amazon_review_polarity_csv.tgz
- Yelp Reviews - Full: https://s3.amazonaws.com/fast-ai-nlp/yelp_review_full_csv.tgz
- Yelp Reviews - Polarity: https://s3.amazonaws.com/fast-ai-nlp/yelp_review_polarity_csv.tgz

Some ML techniques:

- Collaborative Filtering
- Bayesian Recommendation
- Restricted Boltzmann Machines
- Recurrent Neural Networks
- Gated Recurrent Units (GRU)
- Matrix Factorization Methods such as SVD and SVD++
- K-Nearest-Neighbors

Idea 3

Use public traffic cameras to recognize license plates to build up a dataset about car travelling history in Los Angeles city in order to provide a prediction how to pick a group cars at a specific time to travel from point A to point B.

- Resource to collect high definition images from public traffic cameras?
- Use OpenALPR to recognize license plates (https://github.com/openalpr/openalpr)
- Use Uber Movement dataset to predict travelling time (https://movement.uber.com)