# Stylist Assistant

ECE 493 Capstone Design Project 17/18
Arjun Kalburgi, Rui Wu, and Vitor Mendonca

Personal Stylist App

The Stylist Assistant is a companion for stylists and their clients, helping clients with their daily fashion choices. By uploading wardrobes and styles, the app smartly matches them to create recommended outfits for the client.


The application is built with Ionic Cordova, allowing for a webapp, iOS and Android app in one codebase. Data is stored on the real-time Firebase, which handles data updating automatically.
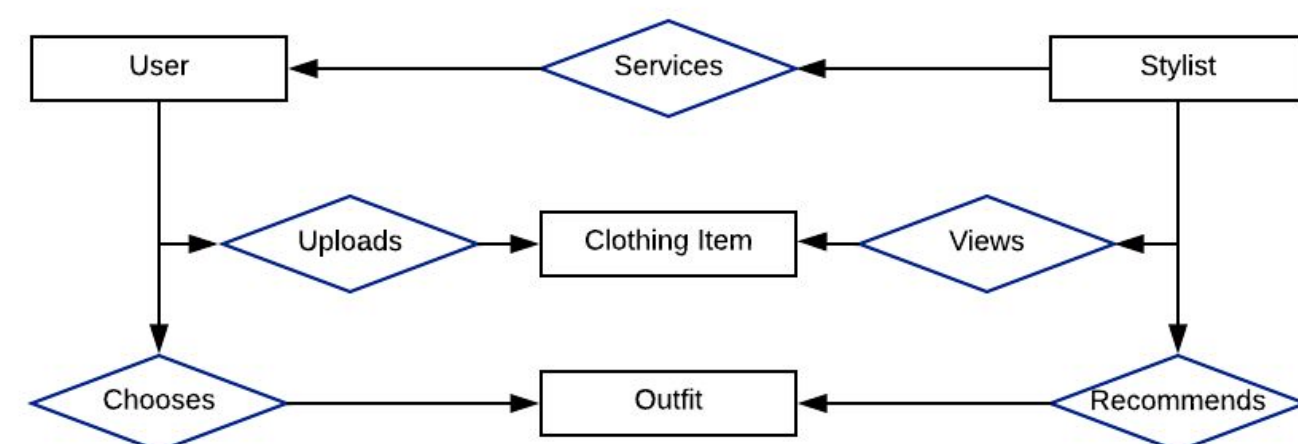

DeepFashion

Our main source of image data was the DeepFashion project, a large-scale clothes database created by researchers at the Chinese University of Hong Kong, for their own FashionNet image processing project. The dataset contains hundreds of thousands of fashion images annotated with rich information of clothing items. Each image in this dataset is labeled with 50 categories, 1,000 descriptive attributes, bounding box and clothing landmarks.
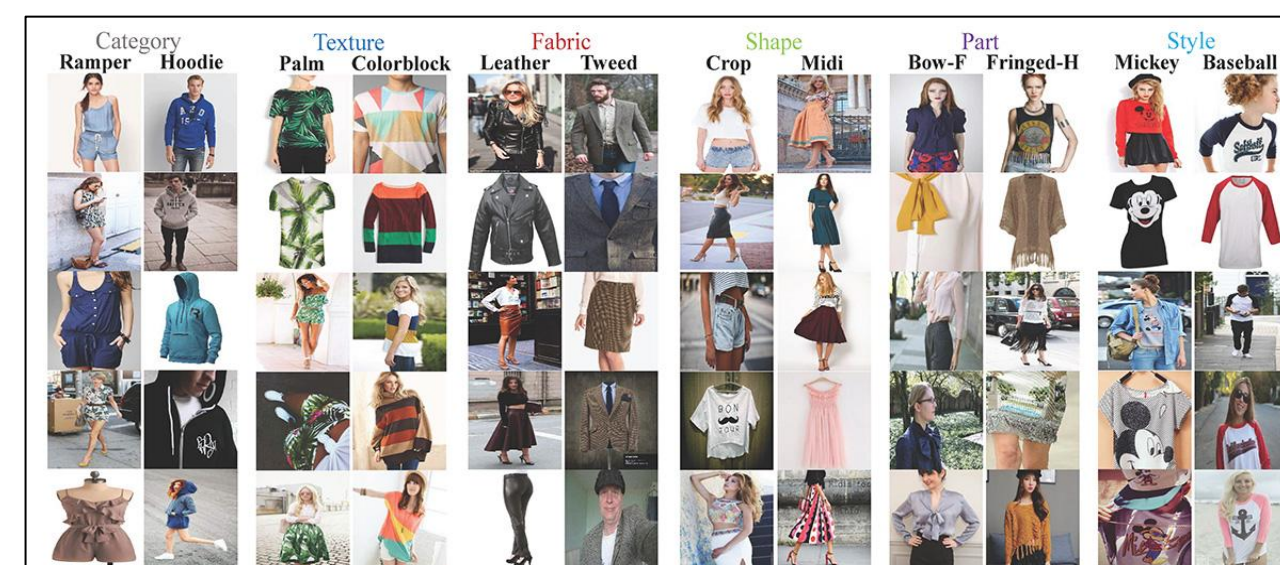
Recommender System

The recommender compares categories between two outfits and the items of the outfits to develop a similarity rating for each potential outfit in the client's wardrobe..
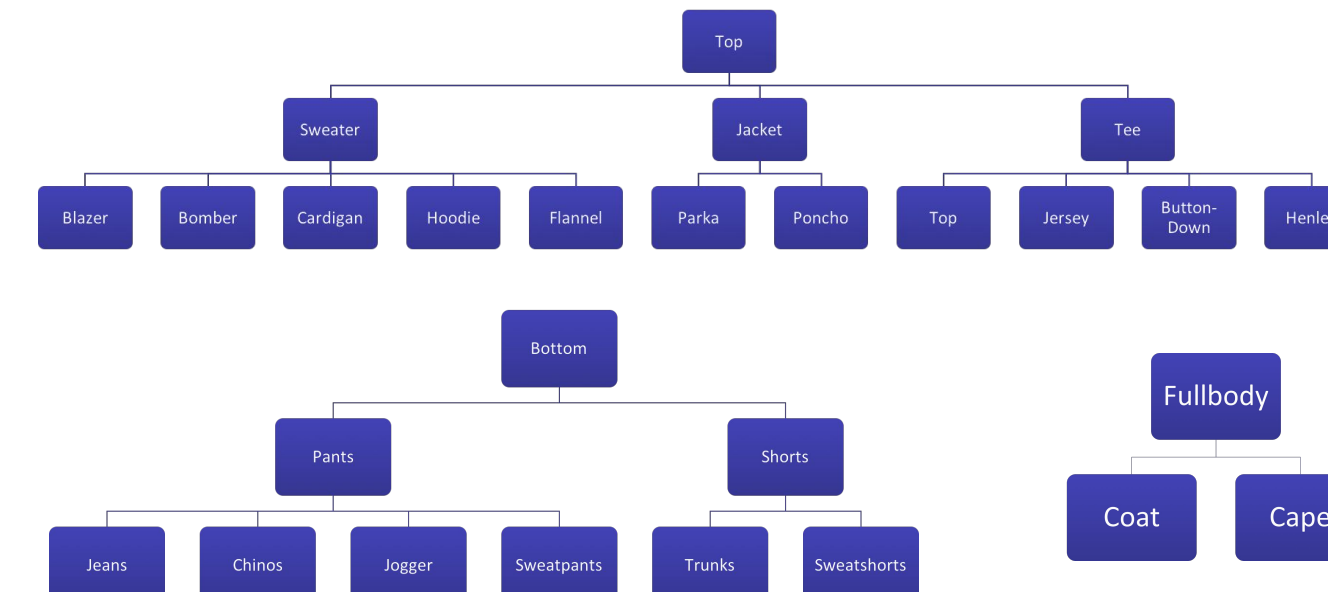
Neural Network Architecture

Our neural networks were directly based on Simonyan & Zisserman's submission to ImageNet Challenge 2014. We implemented the version C, with 16 weight layers, with some simplifications.

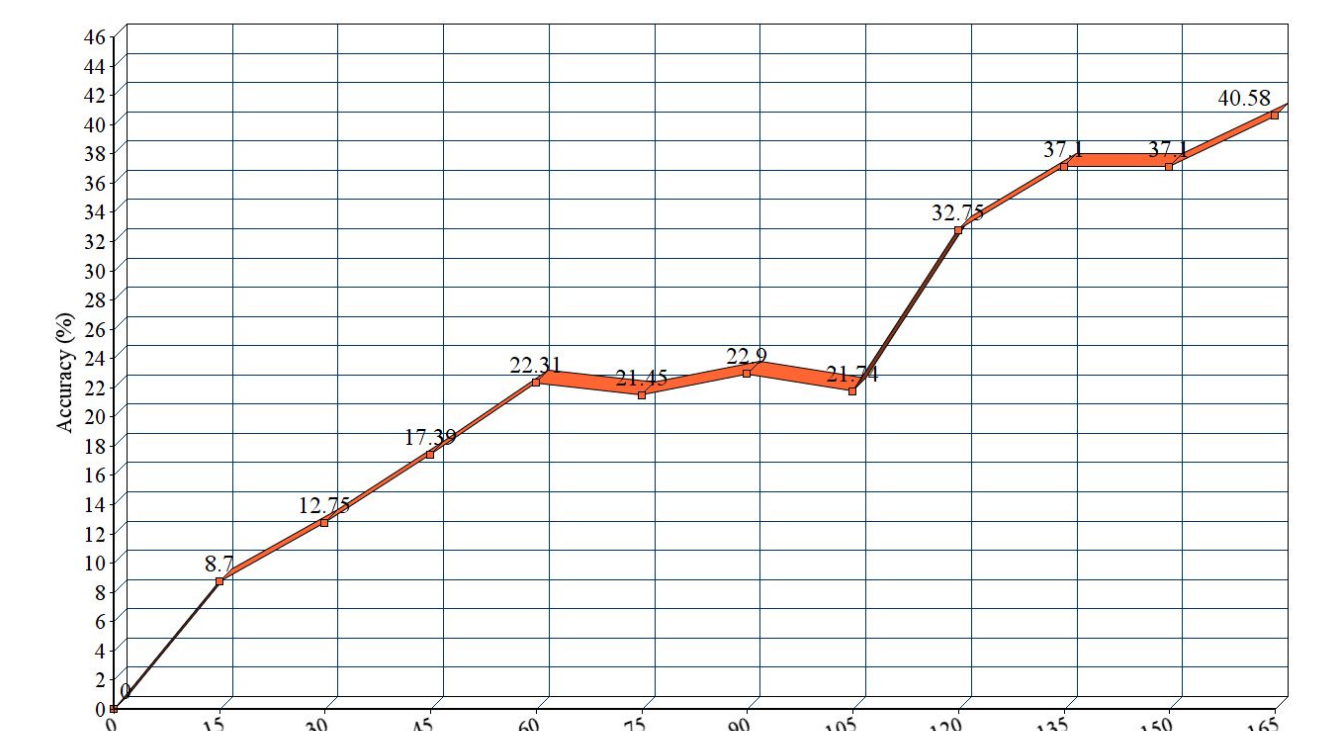| ConvNet Configuration					
A	A-LRN	B	C	D	E
11 weight layers	11 weight layers	13 weight layers	16 weight layers	16 weight layers	19 weight layers
input (224 × 224 RGB image)					
conv3-64	conv3-64 LRN	conv3-64 conv3-64	conv3-64 conv3-64	conv3-64 conv3-64	conv3-64 conv3-64
maxpool					
conv3-128	conv3-128	conv3-128 conv3-128	conv3-128 conv3-128	conv3-128 conv3-128	conv3-128 conv3-128
maxpool					
conv3-256 conv3-256	conv3-256 conv3-256	conv3-256 conv3-256	conv3-256 conv3-256 conv1-256	conv3-256 conv3-256 conv3-256	conv3-256 conv3-256 conv3-256 conv3-256
maxpool					
conv3-512 conv3-512	conv3-512 conv3-512	conv3-512 conv3-512	conv3-512 conv3-512 conv1-512	conv3-512 conv3-512 conv3-512	conv3-512 conv3-512 conv3-512 conv3-512
maxpool					
conv3-512 conv3-512	conv3-512 conv3-512	conv3-512 conv3-512	conv3-512 conv3-512 conv1-512	conv3-512 conv3-512 conv3-512	conv3-512 conv3-512 conv3-512 conv3-512
maxpool					
FC-4096					
FC-4096					
FC-1000					
soft-max					

Results and Issues

We were ultimately unsuccessful in obtaining sufficient accuracy in our classification.

We found the dataset to be have very inaccurate attributes, thus they were dropped as the neural net needs consistent data to yield good results.

70% similarity with attribute tagging.

70% similarity with category tagging.

Additionally, categories in the dataset were heavily skewed in terms of number of items per category. We modified the training sample with an equal number of data points in each category to improve accuracy.

Accuracy vs Epochs in Training

More Information

Simonyan & Zisserman:
http://arxiv.org/abs/1409.1556v6
DeepFashion:
http://mmlab.ie.cuhk.edu.hk/projects/DeepFashion.html

UNIVERSITY OF ALBERTA

Department of Electrical & Computer Engineering