DEEP LEARNING FINAL PROJECT GROUP 4

Objective

The goal of this project is to develop a model that uses computer vision to take either text input or image input from users requesting fashion recommendation(s) and present them with an apparel or apparel that closely matches what they are looking for. The Global fashion industry was estimated at **$1.7 Trillion** in 2023. In the United States, the fashion industry is valued at **$343.70 Billion**, at **$1460** per capital spending on clothing and footwear, the United States leads the pack as the top per capita spender on fashion. This shows how important fashion is to individuals, but this is particularly true for individuals who are considered Gen Z. **36%** of Gen Z buy new clothing at least every month. There has been significant work done with computer vision in healthcare, sports, automobile industries but not so much work has been done in the fashion industry and we hope to contribute to this area of research and use computer vision to recommend personalized fashion products based on fashion attributes evaluated by fashion professionals and experts. We hope to create a style clustering model that makes robust predictions making personalized recommendable both affordable, reproducible and with some quantitative metric.

Dataset

- ➢ We found our dataset on DeepFashion. A website containing massive descriptive clothing categories. **289,222** number of clothing images with **50** number of categories of **clothing**, and **1,000** number of clothing attributes.
- ➢ We also found another dataset on Kaggle. This dataset contains images of people wearing a variety of clothing types in a variety of poses.

Network and Framework

Now, we are considering either TensorFlow or PyTorch but the specific framework. We will have to customize some of the out-of-the box APIs available to optimize the model Convolutional Neural Network required to actualize this project.

We intend to build upon previous work and research done in this fashion space but specifically, we are referencing research done by *H Jeon, Youngseung & Jin, Seungwan & Han, Kyungsik. (2021). FANCY: Human-centered, Deep Learning-based Framework for Fashion Style Analysis. 2367-2378. 10.1145/3442381.3449833* as our reference material. In this research they used SSD and faster R-CNN.

Metrics

To assess the performance of our model, we will intend to use a combination of accuracy, precision, recall, and F1 score. These metrics will help us understand not only how often our model is correct (accuracy) but also its reliability in terms of false positives and false negatives (precision and recall). We will also check its real-time performance Considering the application's real-world usage, we'll measure the model's response time, efficiency in processing requests, and accurate recommendations.

Timeline

- (1 Week) Exploratory Data analysis and data cleaning
- (1 Week) Modeling
- (1 Week) Front End User Interface
- (1 Week) Final Testing, Deployment and Presentation