Fashion Wizard

Mahbubur Rahman
Matrikel Number: 914626
Course: Learning from Images, M.Sc in Data Science
Berliner Hochschule für Technik Berlin

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Project description

Similar Cloths Search using a Image Key(Image can be a pure cloth image or Human/Object wearing clothes)

In the real life, when we want to buy a specific or similar cloths from a cloth store(for example: H&M), we show a sample picture to the sales person. Then, the sales person displays the exact cloth or some cloths of similar patterns and textures.

Taking the idea into image processing and deep learning, the proposed application will take an image as input for the search key and give the exact or similar cloths(similar patterns and textures) as output. This application could be used in the online store or chatbot.

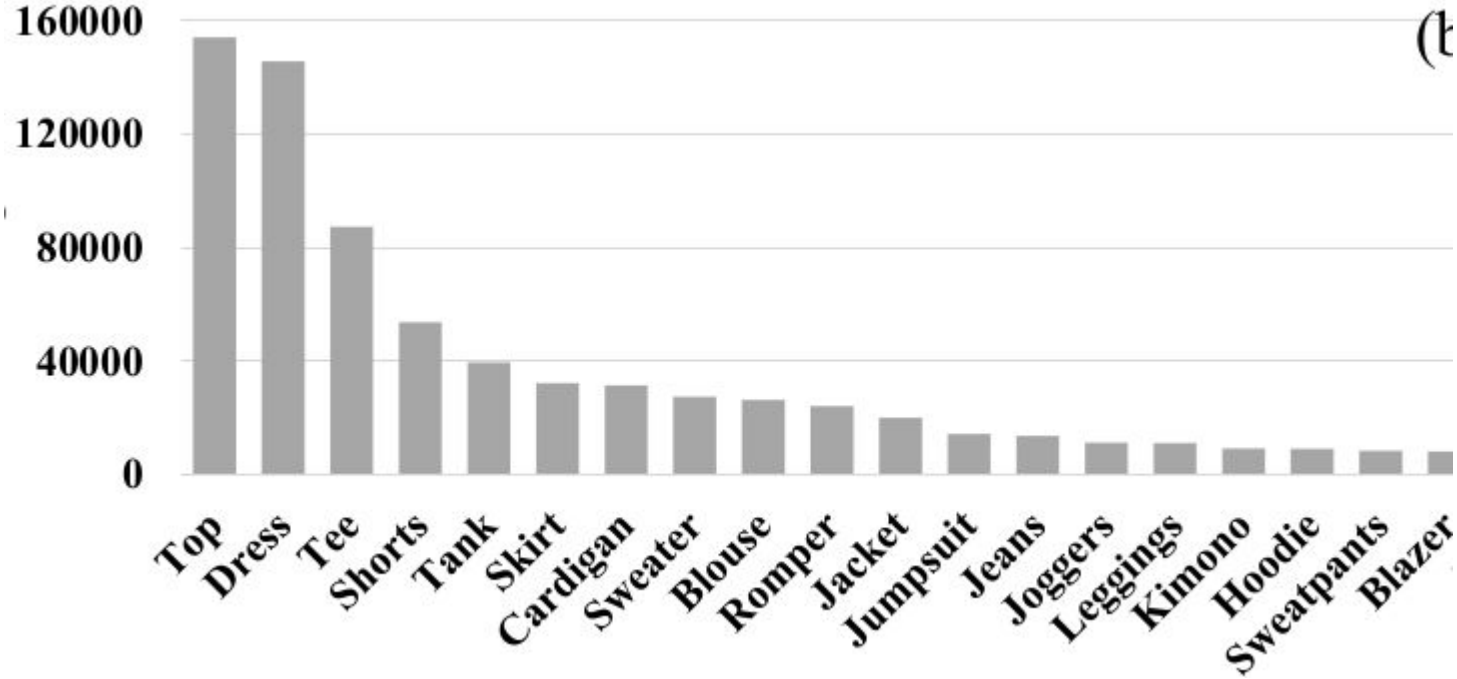
Related dataset and paper

- **Dataset:**
  - DeepFashion: In-shop Clothes Retrieval
    In-shop Clothes Retrieval Benchmark evaluates the performance of in-shop Clothes Retrieval. This is a large subset of DeepFashion, containing large pose and scale variations. It also has large diversities, large quantities, and rich annotations, including
  - 7,982 number of clothing items;
  - 52,712 number of in-shop clothes images, and ~200,000 cross-pose/scale pairs;
  - Each image is annotated by bounding box, clothing type and pose type.
  - Contain JSON files for segmented annotation for different clothes types, accessories, body parts.

- **Paper:**
  - DeepFashion: Powering Robust Clothes Recognition and Retrieval with Rich Annotations
    Liu, Ziwei and Luo, Ping and Qiu, Shi and Wang, Xiaogang and Tang, Xiaoou
    Proceedings of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)
    June, 2016
    http://mmlab.ie.cuhk.edu.hk/projects/DeepFashion.html

Related dataset and paper

The figure illustrates the image number of the top-19 categories.



Source: DeepFashion: Powering Robust Clothes Recognition and Retrieval with Rich Annotations

Related dataset and paper

Color Mapping Labels

Color(R-G-B)	Label
0-0-0	background
255-250-250	top
250-235-215	skirt
70-130-180	leggings
16-78-139	dress
255-250-205	outer

Source: DeepFashion: Powering Robust Clothes Recognition and Retrieval with Rich Annotations

Related dataset and paper

Color Mapping Labels

Color(R-G-B)	Label
255-140-0	pants
50-205-50	bag
220-220-220	neckwear
255-0-0	headwear
127-255-212	eyeglass
0-100-0	belt

Source: DeepFashion: Powering Robust Clothes Recognition and Retrieval with Rich Annotations

Related dataset and paper

Color Mapping Labels

Color(R-G-B)	Label
255-255-0	footwear
211-211-211	hair
144-238-144	skin
245-222-179	face

Source: DeepFashion: Powering Robust Clothes Recognition and Retrieval with Rich Annotations

Application workflow

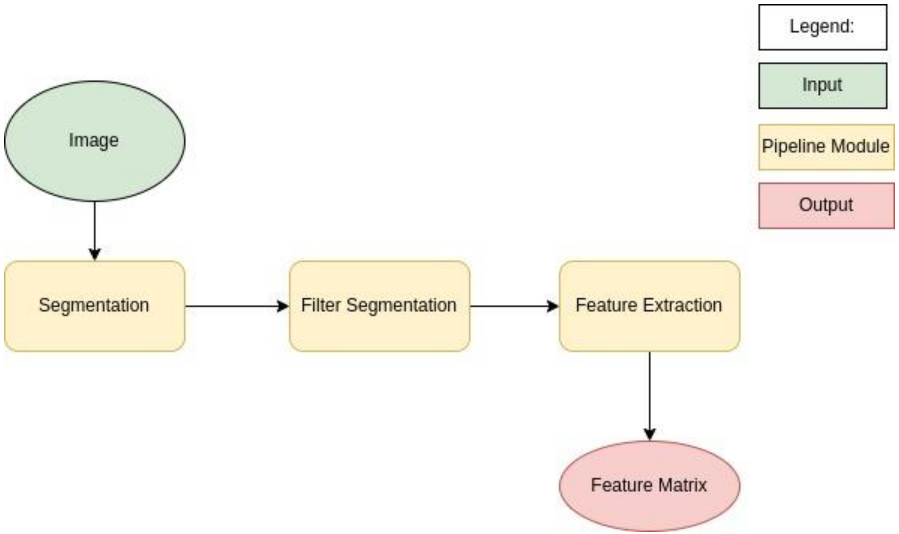
Pipeline 1

Artificial Algorithms for this pipeline

Masked R-CNN for segmentation

SuperPoint for feature extraction

(**Paper**: SuperPoint:
Self-Supervised Interest Point
Detection and Description)



Source: Own approach

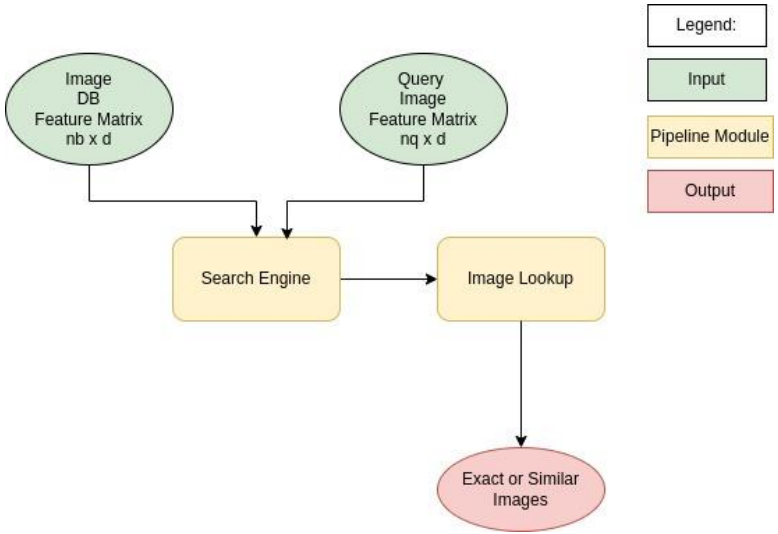
Application workflow

Pipeline 2

Artificial Algorithms for this pipeline

FAISS for index based vector search using euclidean distance and cosine similarity

It also uses K-mean clustering.



Source: Own approach

Difference between paper implementation

FashionNet	Fashion Wizard
Use fixed number of landmarks for feature extraction or descriptors. Here landmark means keypoints (Upper body clothes uses 6 landmarks, Lower body clothes uses 4 landmarks, Whole body clothes uses 8 landmarks)	Use dynamic number of landmarks or keypoints based on the variety of dataset and it's volume.
Define landmarks of ROI(for example: Top or Skirt etc) using the bounding boxes, so there are overlapping bounding boxes from others(for example: hand, other type of clothes(coat over shirt etc))	Define landmarks of ROI using segmented color mapping and bounding boxes to get the optimal keypoints and descriptors

Source: Own approach

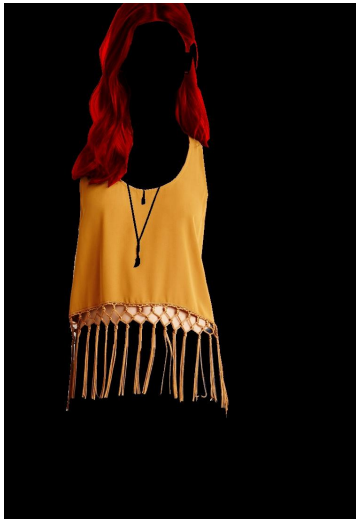
Difference between paper implementation

FashionNet	Fashion Wizard
Pipeline of FashionNet consists of deep convolutional and fully connected neural network.	2 pipelines use in the Fashion Wizard to fulfill different tasks using different artificial intelligence algorithms. For example: for segmentation R-CNN, for keypoint, descriptors SuperPoint, for search FAISS etc.

Source: Own approach

Evaluation

ROI using segmented color mapping

Source: Own approach

Evaluation

Query	Result 1	Result 2	Result 3	Result 4
				
				

Source: Own approach

Future work

- Implement R-CNN in the pipeline 1, at the moment it is not possible because of time and resource constraints.

- Improve the segmentation performance so that ROI selection will be more precise using color mapping and bounding box because at present, there are some error in the color mapping in the given segmentation json file in the dataset.

- Add more configuration on FAISS to improve vector search, for example: add cosine similarity, because at present I just configure FAISS search using L2 distance metric.

References

1. http://mmlab.ie.cuhk.edu.hk/projects/DeepFashion/FashionSynthesis.html
2. https://liuziwei7.github.io/projects/DeepFashion.html
3. SuperPoint: Self-Supervised Interest Point Detection and Description(https://arxiv.org/abs/1712.07629)
4. https://github.com/facebookresearch/faiss

Question & Answer:

Source:
https://thumbs.dreamstime.com/b/discussion-complex-like-puzzle-pictured-as-word-discussion-puzzle-pieces-to-show-discussion-can-be-difficult-164222140.jpg