BJIT Ltd

Weekly Report

Fashion Recommender System

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Project Goal

The goal of this project is to develop a **Fashion Recommender System** that recommends fashion items that are similar to given or selected one. This system will function calculating image similarity ranking.

A customer may upload an image of a fashion item or the image might be selected from an image database, then the recommender system will calculate the similarity ranking and predict some similar fashion items based on similarity ranking.

The image dataset will have metadata for the images. This metadata includes the information of gender, age category(men/women/girls/boys), item category, season, year etc of a certain fashion item. We will include these metadata of a fashion item image to filter age, gender, season etc based fashion that are complex(Not possible) to get from image alone. It will help us to avoid age and gender related major issues(mistakes) to make the system more accurate.

We will apply Machine learning based cosine similarity models to find similarity(on metadata) among fashion items first. It will help us to filter out items based on age, gender etc.

Then we will use a Deep learning CNN model to extract features of fashion item images. Here we will apply cosine similarity on extracted features to get image similarity ranking and will use a triplet of images to get image similarity. There will be the given image, the positive(most similar) image and the negative(most dissimilar) image, from these three images our model will find the most similar images for recommendation.

We may also use NLP to get the current Fashion trends from Social media like twitter and apply them for more accurate, specific, trendy and personalized recommendations. We may deploy humans(Stylists) to do it.

Goal of This Week

1. Extensively study ResNet and transfer learning on it.
2. Combine Resnet, CNN, K-NN/ Cosine similarity to apply in visual similarity ranking.
3. Implement and build our own model following existing ones and measure performance to ensure our goal.
4. Analyze model performances and data to decide/ redefine the business goal.
5. Analyze gained knowledge and data to meet the business goal the most.

Accomplishments

- Explored ResNet model and transfer learning on it.
  - [Variants of ResNet](#)
  - [Xception](#)
  - [Comparative study between ResNet50 and Xception](#)

- Comparison and application of ImageNet based different models.
  - [ImageNet: VGGNet, ResNet, Inception, and Xception with Keras](#)
  - [https://keras.io/applications/](#)
  - [Keras Tutorial : Using pre-trained ImageNet models](#)

- Studied some existing implementations of image similarity with ResNet, CNN, K-NN and Cosine similarity.
  - [https://www.kaggle.com/marlesson/building-a-recommendation-system-using-cnn-v2](#)

Task-Time Table

Engineer	Task	Duration(hrs)	Total(hrs)
Shohag Mia	ResNet50, Image classification using ResNet50	20	36
	Xception	8	
	Comparative Study between ResNet50 and Xception	8	
Muttakin	Study of VGG, ResNet50, Xception and Inception	16	40
	Application of these models in Keras	16	
	Recommender engine with ResNet50 and Cosine similarity	8	

Plans for Next Week

1. Study and explore ImageNet based models(VGG, ResNet, Xception, Inception)
2. Comparison of accuracy, model size and inference time of the models.
3. Apply these models in our problem domain.
4. Analyze model performances and data to decide/ redefine the business goal.

Project Status
Green

    Note -
- ○ Green means project is on schedule and there are no major issues
- ○ Yellow means the project is somewhat delayed and/or there may be some major risks at the current point
- ○ Red means the project is seriously at risk of being delayed and/or there are some major risks affecting the project

Project Timeline(Business & Data understanding)

Project Timeline(Business & Data understanding)

	Task Name	Subtasks	1st week	2nd week	3rd week	4th week	5th week
01	Business understanding	Determining business objectives					
		Assessing situation					
		Determining project goals					
		Producing project plan					
02	Preprocess data	Collecting initial data					
		Describing data					
		Exploring data					
		Verifying data					

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Query

None

Key Issues, Risks or Concerns

Item	Action/Resolution	Responsible	Completion Date
GPU requirement	Needs GPU to explore potential models	Javed Hasan	