Personalized Fashion Recommendation using Pairwise Attention

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Introduction

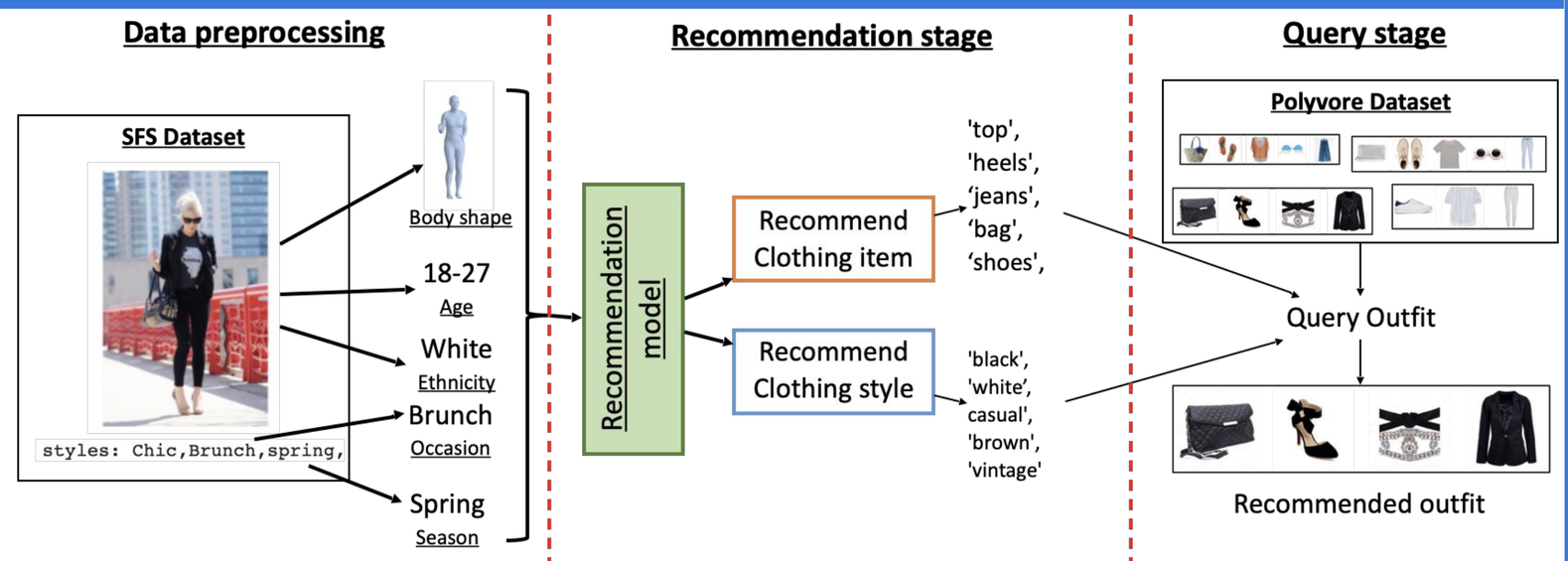
- Fashion is one of highest revenue industries, Online fashion shopping has some obstacles: Do not know what is suitable

Motivation

- However, fashion recommendation systems have various existing problems:
  - Lack of personalization
  - Low variety in dataset (types of users and recommended clothing)
- We want to make the recommendation system more personalize based on occasion and user's characteristic

Idea

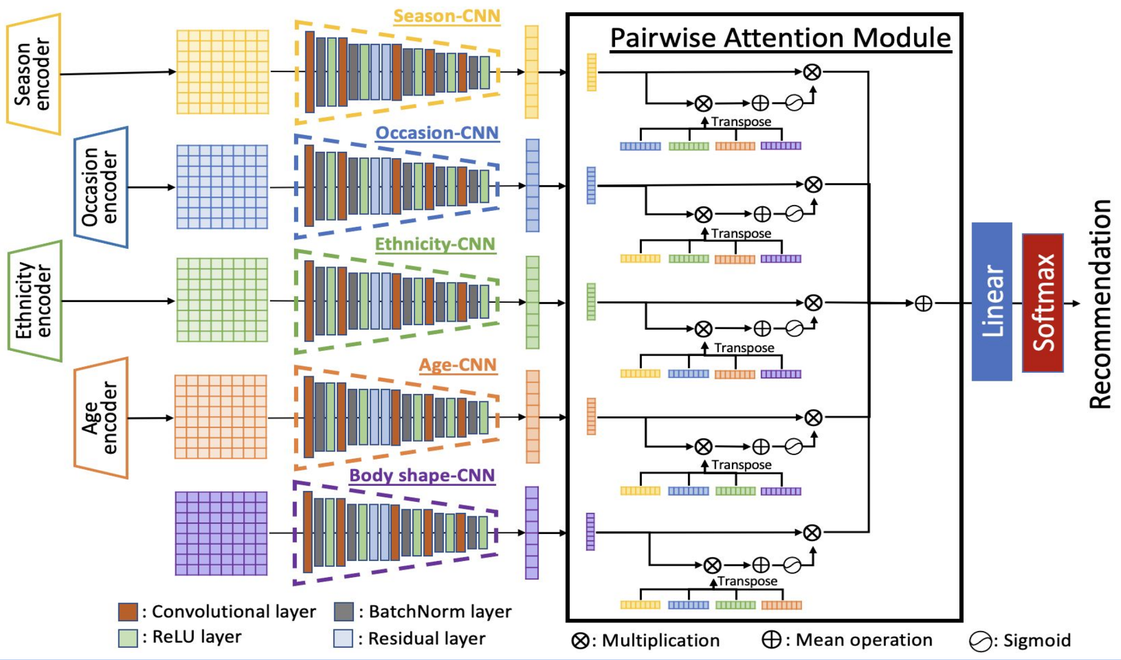
- ➢ Use more personal information
  - More Personalized recommendation
- ➢ Form the new recommendation system
  - Recommend more variety clothing types
- ➢ Use SFS and Polyvore dataset
  - Low variety in the dataset



Proposed method

Our method can seperate into 2 main stages.

1. Recommendation stage
   - It is used for generating recommended clothing item that match to specific user based on their characteristic.
   - The pairwise attention module can generate the weight attention score for each input feature.

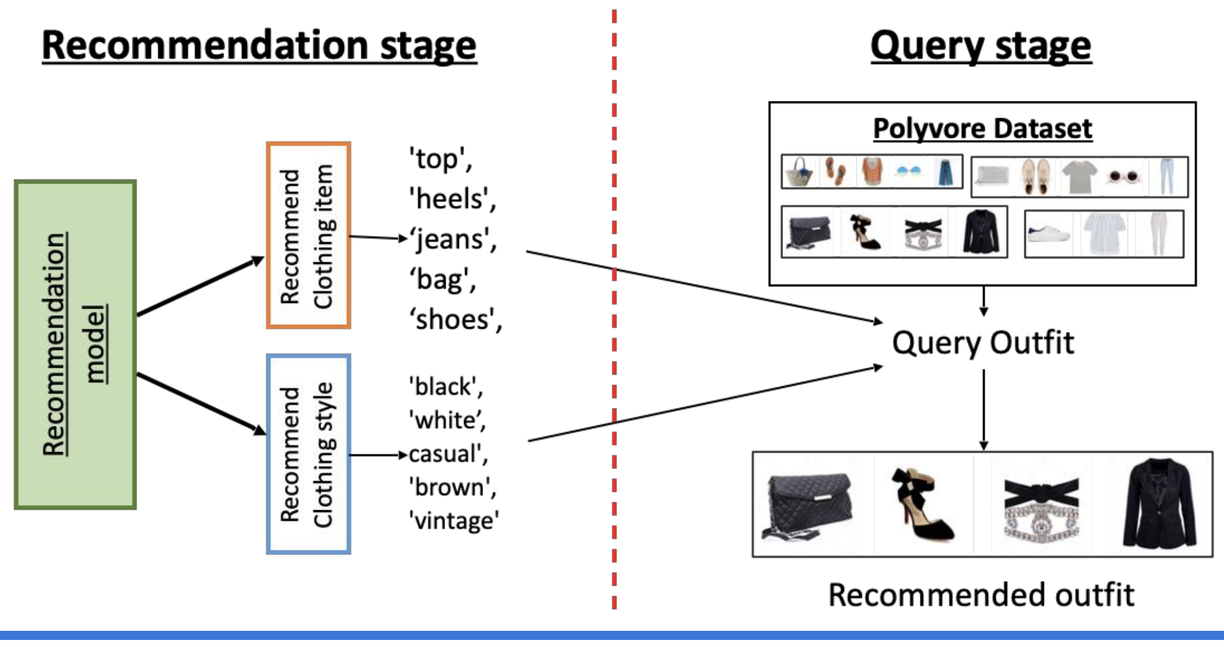


Pairwise calculation

$$F = \{f_{season}, f_{occasion}, f_{age}, f_{ethinicity}, f_{body}\}$$

$$W_f = Sigmoid\left(\frac{1}{|F|-1}\sum_{x \in F-f} f \otimes x^T\right); \quad where\ f \in F \qquad \therefore F_{fusion} = \frac{1}{|F|}\sum_{f \in F} W_f \otimes f$$

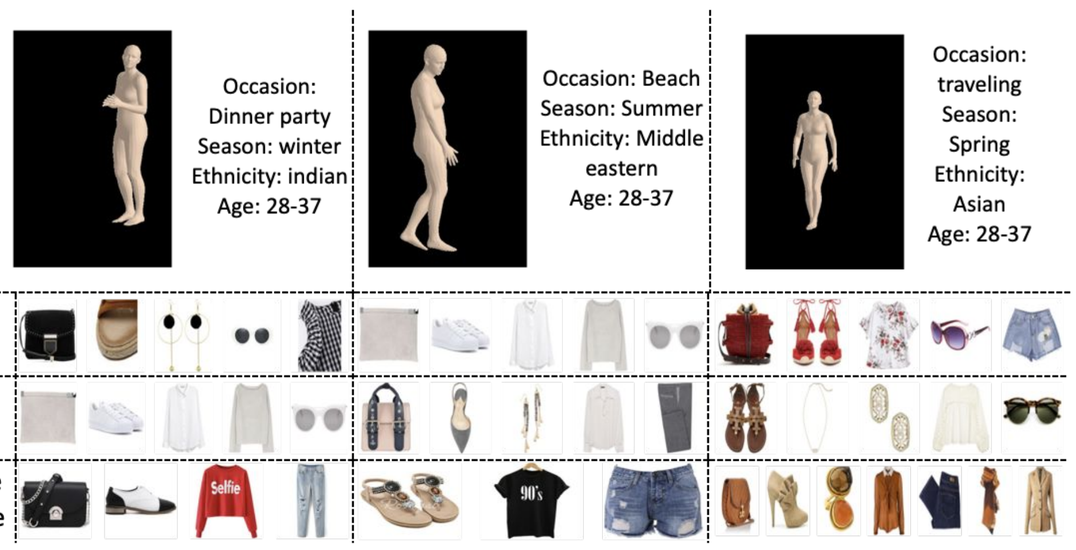
2. Query stage
   - Query using output from recommendation model
   - Using GloVe to encode, and Cosine similarity



Results

- The proposed method can provide more personal recommendations and more variety in clothing.
- The proposed method provides better performance in mAP and mAR.
- Using a survey, the proposed method is preferred by 58% of participant.

Qualitative Result



Quantitative Result

	Item recommendation				Attribute recommendation			
Model input	**mAP@5**	**mAR@5**	**mAP@20**	**mAR@20**	**mAP@5**	**mAR@5**	**mAP@20**	**mAR@20**
VIBE (Comparison method)	0.4859	0.4865	0.7103	0.6108	-	-	-	-
AFF (Naïve)	0.5708	0.5714	0.8165	0.8676	0.7427	0.5701	0.7810	0.4356
Occasion + Season + Age	0.8039	0.8045	0.8773	0.8822	0.7849	0.7854	0.7991	0.7789
Occasion + Season + Age + Ethnicity	0.8279	0.8286	0.8893	0.8900	**0.8842**	0.6263	**0.9459**	0.2871
Occasion + Season + Age + Ethnicity + Body shape	**0.8311**	**0.8316**	**0.8907**	**0.8905**	0.8377	**0.8382**	0.8188	**0.8203**

Tbl.1 quantitative results comparisons of the proposed method and comparison method

Questionaire Result

- Number of participants (Ethnicity: Asian)
  - 31 (21 Female, 10 Male)
- Questions
  - 43 queries (Ethniciy: Asian with random occasion, season, age)

Model	Female	Male	SUM
Comparison (ViBE)	9	4	13 (41.94 %)
Proposed	12	6	18 (58.06 %)

Tbl.2 Score for each method chosen by participant