An Application to Generate Style Guided Compatible Outfit

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Introduction

Outfit Recommendation

- Outfit recommendation is a relatively well studied area in which researchers aim to recommend outfits based on the notion of learning compatibility between lifestyle or fashion items [11, 17–19].

- Outfits can be categorized into different styles
  - Work
  - Casual
  - Party
  - Travel
  - …

- A substantial volume of work has been done on the specific area of personalised recommendations [13, 20].

- None of them specifically take outfit style into account while learning compatibility within outfits.

Outfit

https://depositphotos.com/39449619/stock-photo-overhead-of-essentials-hipster-woman.html

https://everydaysavvy.com/kohls-business-casual-spring-outfits/

Motivation and Objective

Style

- An outfit may look **compatible** under **one style construct,** but **not in another**.
- Outfit **compatibility** depends on **style.**

Objective - For a chosen fashion item (as an anchor), a set of desired item categories as a template and a user-defined outfit style, we aim to complete the look by generating top-k compatible outfit sets (each having the common anchor item and other items confirming the template).

Template: < **tops**, skirts, shoes, watches >
where **tops** is the category of the anchor

	Outfit o_1 (Formal)	Outfit o_2 (Casual)
Style-Independent	$compat(o_1) = 1$	$compat(o_2) = 0$
Style-Guided	$compat(o_1 \mid style = formal) = 1$	$compat(o_2 \mid style = casual) = 1$

Illustration of the effectiveness of style-guided outfit generation over a style-independent variant.

Existing Research

Compatibility Model

[12] Fashion Outfit Complementary Item Retrieval

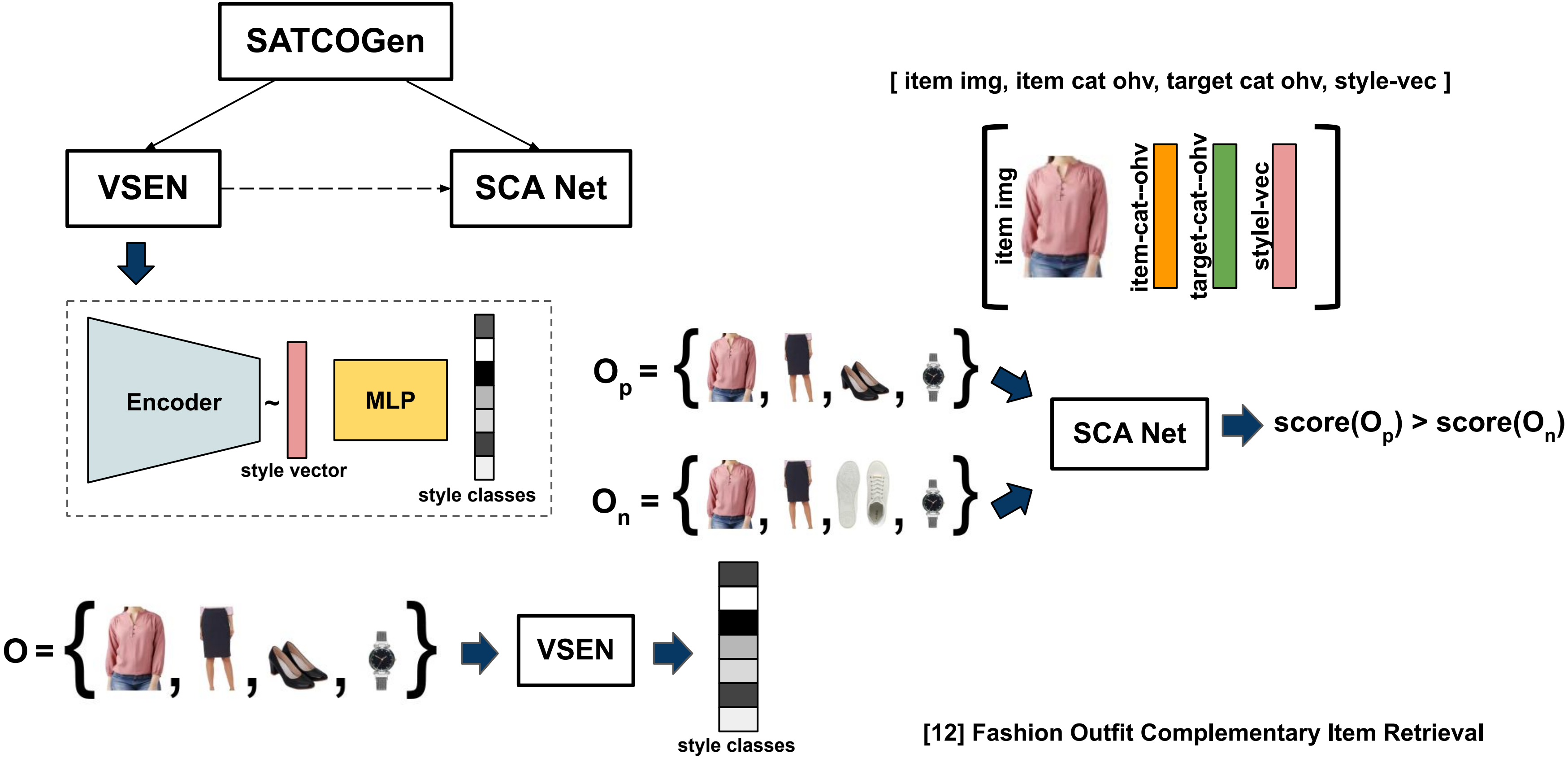
Compatibility + Style Model

[8] ThemeMatters: Fashion Compatibility Learning via Theme Attention

- We augment style information with the subspace attention network proposed in [12] to learn an improved compatibility prediction model named as SATCOGen (Style-Attention-based Compatible Outfit Generation).

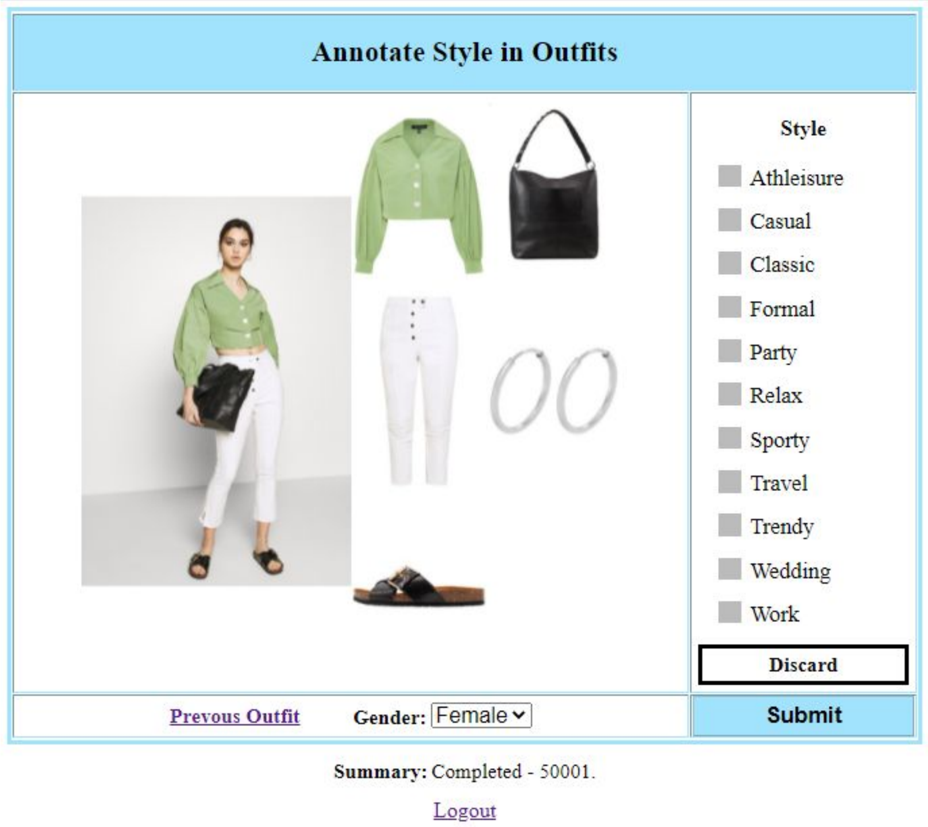
- The learned model helps in generating suitable outfits for a given anchor item in the most efficient way.

Methodology



[12] Fashion Outfit Complementary Item Retrieval

Data Annotation



- Outfit Look + Individual Items
- Style tags
- Discard
- Gender
- Previous Outfit

https://www.zalando.co.uk/

Dataset Statistics and Evaluation Metrics

Distribution of compatible outfits across different styles

Style	Work	Casual	Party	Relax	Travel	Athleisure	Sporty
Training	841	13062	1215	473	2128	1160	534
Validation	108	1679	156	61	272	149	68
Testing	251	3917	362	140	631	348	160

Fill in the Blank (FITB) Accuracy

Q: q_1 | q_2 | _ | q_4 A: a_1 | a_2 | a_3 | a_4

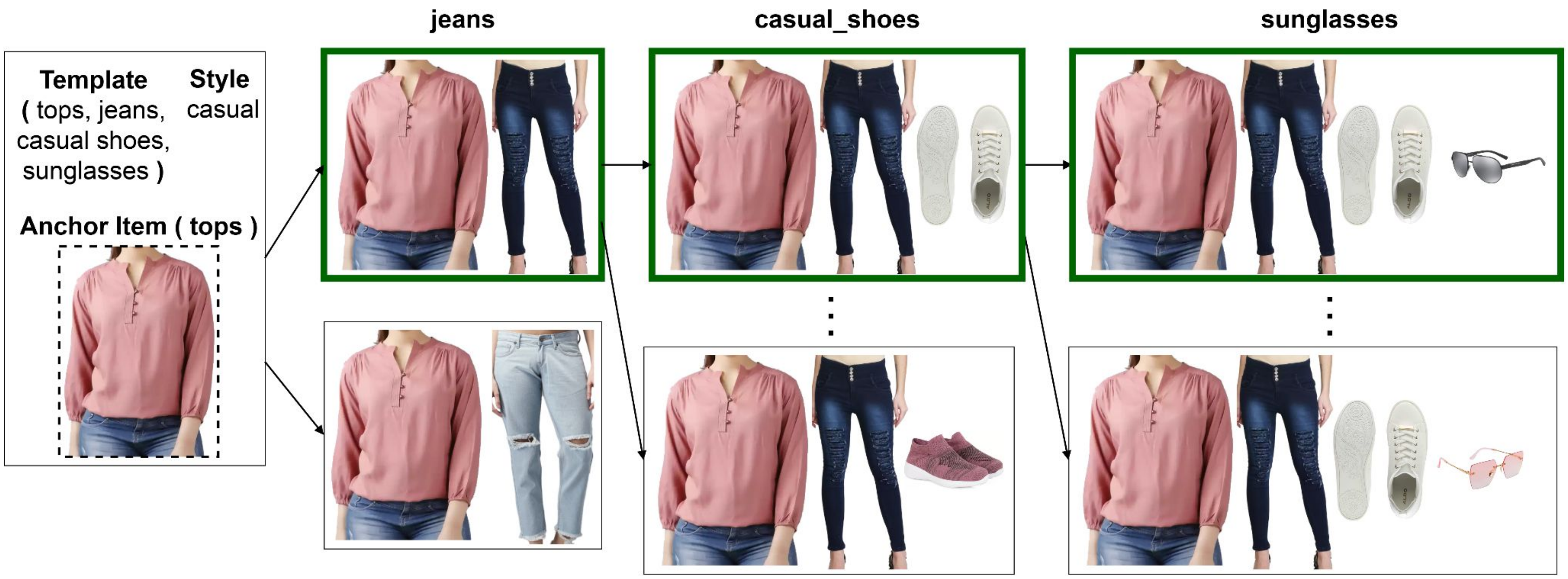
Compatibility AUC (Compat. AUC)

O_p: q_1 | q_2 | q_3 | q_4 O_n: q_1 | x | q_3 | q_4

Hard Negative (HN) Samples: Random sampling from matching fine-grained categories. For example, replacing a shirt in a positive outfit with a random shirt.

Soft Negative (SN) Samples: Random sampling from matching high level categories. For example, replacing a top-wear in a positive outfit with a random top-wear.

Outfit Generation



Beam Search

Results

Quantitative

Method	Type	FITB Acc.	Compat. AUC
Theme Matters	SN	47.79 ± 0.07	76.73 ± 0.06
	HN	43.78 ± 0.25	75.97 ± 0.08
SATCOGen	SN	**59.10 ± 0.34**	**88.58 ± 0.08**
	HN	**55.90 ± 0.31**	**86.96 ± 0.06**

Comparison of Compatibility Learning for different methods on the Zalando Dataset

Qualitative

Anchor Topwear

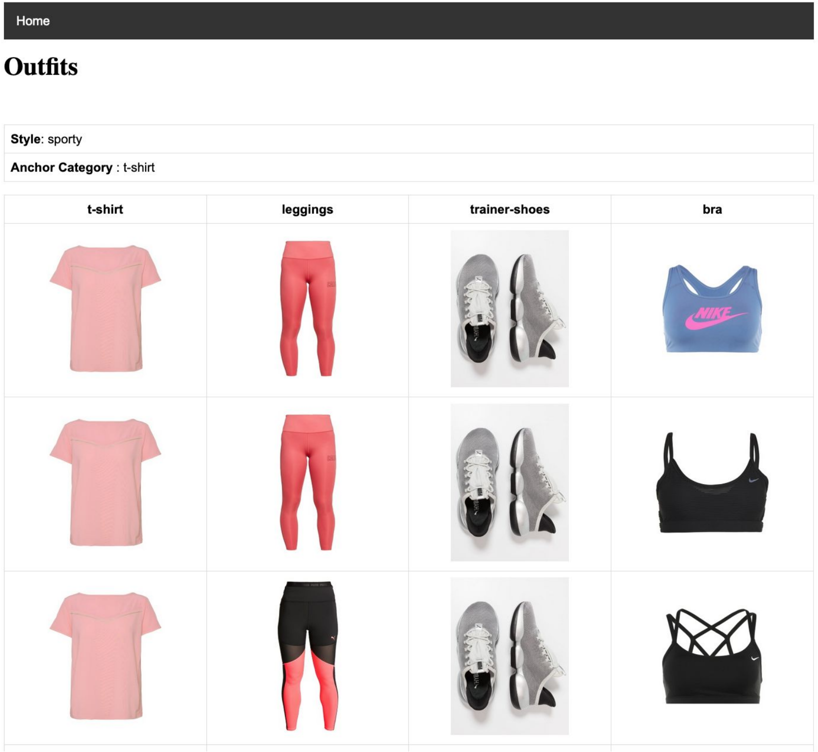
Athleisure's Bottomwear

Casual's Bottomwear

Style Pre-conditioning	Bottomwear 1	Bottomwear 2
Athleisure	0.2621	0.2525
Casual	0.2550	0.2697

Demonstration of how SATCOGen is able to choose diverse style relevant bottomwears for a given parent topwear

Demonstration Interface



Screenshot of the Web Interface used for Demonstration

https://github.com/Lucky-Dhakad/SATCOGen-Demo-api

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Thank You