How big can style be?

Addressing high dimensionality for recommending with style

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Farfetch
embeddings, embeddings everywhere

- **Visual**
  - using product images feature maps

- **Text**
  - using text descriptions of products and brands

- **Collaborative**
  - user-item interaction

addressing high dimensionality for recommending with style
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automated outfits recommendations

- Image embedding
- Attribute embedding
- Description embedding

Fusion Layer

Merge Layer

Dense Layer(s)
addressing high dimensionality for recommending with style

automated outfits recommendations

Image embedding
Attribute embedding
Description embedding

Fusion Layer
Merge Layer
Dense Layer(s)
addressing high dimensionality for recommending with style

similar items recommendations

Resnet50
trained for ImageNet
Extract style features
Gatys et al., 2015. A Neural Algorithm of Artistic Style.

trained on ImageNet
addressing high dimensionality for recommending with style

[224 x 224 x 3]

block1:conv1

block2:conv1

block3:conv1

block4:conv1

block5:conv1

VGG19

trained on ImageNet

1 x 300k
Reducing the embeddings dimension
Feature maps sampling

- reducing from 300k to 3k

(addressing high dimensionality for recommending with style)
T-SVD

- reducing from 300k to 512
Compare the embeddings
related items recommendations

most similar item

Resnet50 top layer

Style embeddings
related items recommendations

most similar item
Takeaways

Style embeddings manage to map distinctive style features
- Better attention to textures and prints

The dimensionality reduction works
- 512 features are sufficient to provide similar results to the vector of 300k
Thank you
check the poster for more examples!

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