

OBJECTIVE

We wish to:

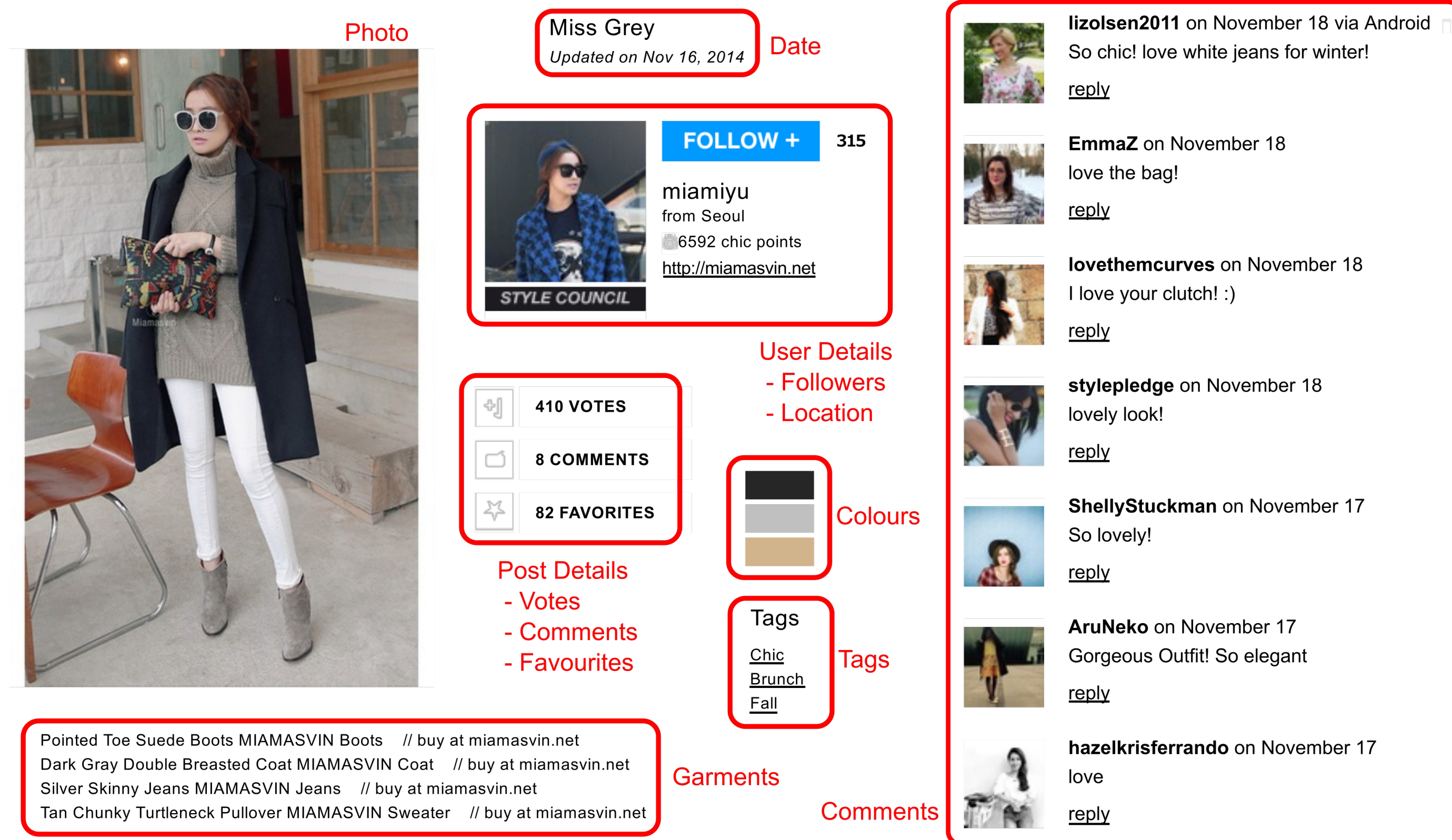
- Model and understand fashionability and its components
- Provide recommendations and advice to users

Novel dataset and Conditional Random Field model that can reason about different aspects of fashionability.

<http://www.iri.upc.edu/people/esimo/research/fashionability/>

FASHION144K DATASET

- Data from crawling the largest fashion social site: chictopia.com
- Normalized votes used as a proxy for fashionability



Miss Grey
Updated on Nov 16, 2014

410 VOTES
8 COMMENTS
82 FAVORITES

User Details
- Followers
- Location

Colours
Tags
Garments
Comments

Pointed Toe Suede Boots MIAMASVIN Boots // buy at miamasvin.net
Dark Gray Double Breasted Coat MIAMASVIN Coat // buy at miamasvin.net
Silver Skinny Jeans MIAMASVIN Jeans // buy at miamasvin.net
Tan Chunky Turtleneck Pullover MIAMASVIN Sweater // buy at miamasvin.net

Dataset Statistics

Property	Total	Per Post
posts	144,169	-
users	14,287	-
locations	3,443	-
males	5%	-
fans	-	1226
comments	-	20.09
votes	-	150.76
favourites	-	27.01
photos	277,537	1.93
tags	13,192	3.66
colours	3,337	2.28
garments	-	3.22

Trendy Cities

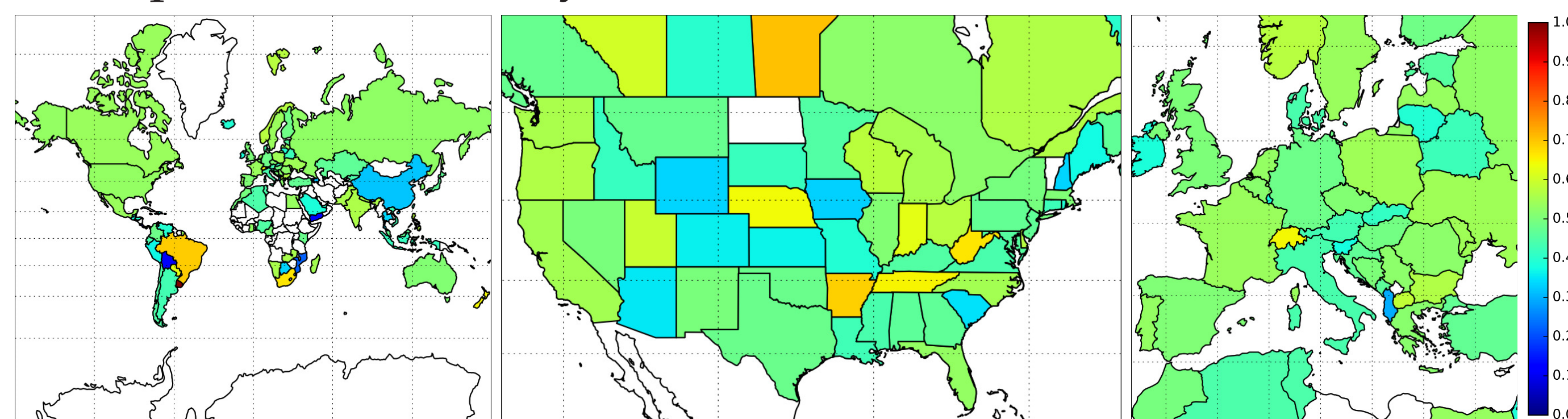
City Name	Score
Manila	6.627
Los Angeles	6.265
Melbourne	6.176
Montreal	6.144
Paris	6.070
Amsterdam	6.059
Barcelona	5.845
Toronto	5.765
Bucharest	5.667
New York	5.514
London	5.444
San Francisco	5.392
Madrid	5.371
Vancouver	5.266
Jakarta	4.398

Influence of Compatriots

Country	Posts	SCC	MSCS	MCS
USA	28.0%	14.86%	3.78	3.76
Unknown	21.8%	-	-	-
UK	5.1%	2.67%	3.80	3.75
Philippines	5.1%	14.54%	3.61	3.72
Canada	4.5%	2.95%	3.68	3.76
Spain	3.9%	1.52%	3.06	3.75
Poland	2.5%	1.07%	3.63	3.80
Australia	2.4%	1.76%	3.62	3.75
France	2.3%	0.46%	3.23	3.75
Romania	2.0%	6.83%	3.73	3.77

SCC Same Country Comments
MSCS Mean Same Country Score
MCS Mean Country Score
Scores from sentiment analysis [4]

Map of Fashionability



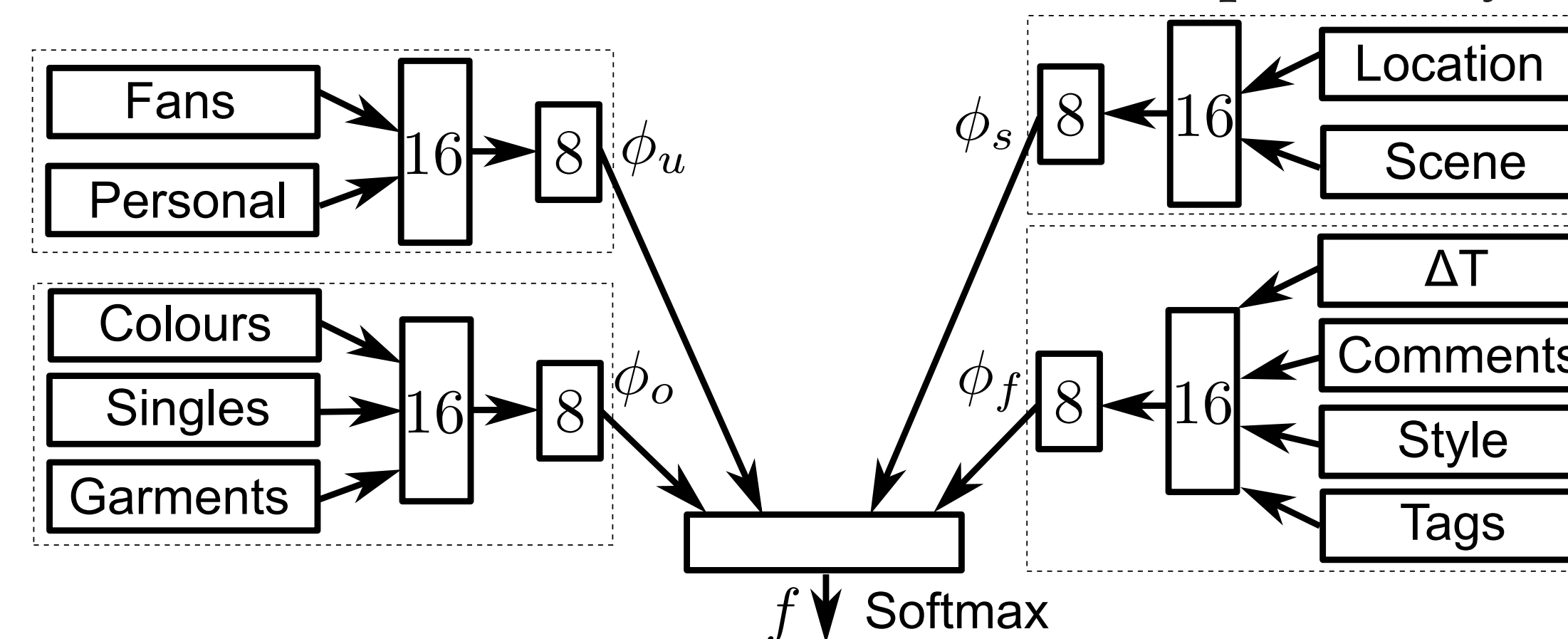
MODEL

- Extract complementary mid-level features with a deep net
- Explicitly model different aspects of fashion using a CRF (u : user, o : outfit, s : setting, f : fashionability)

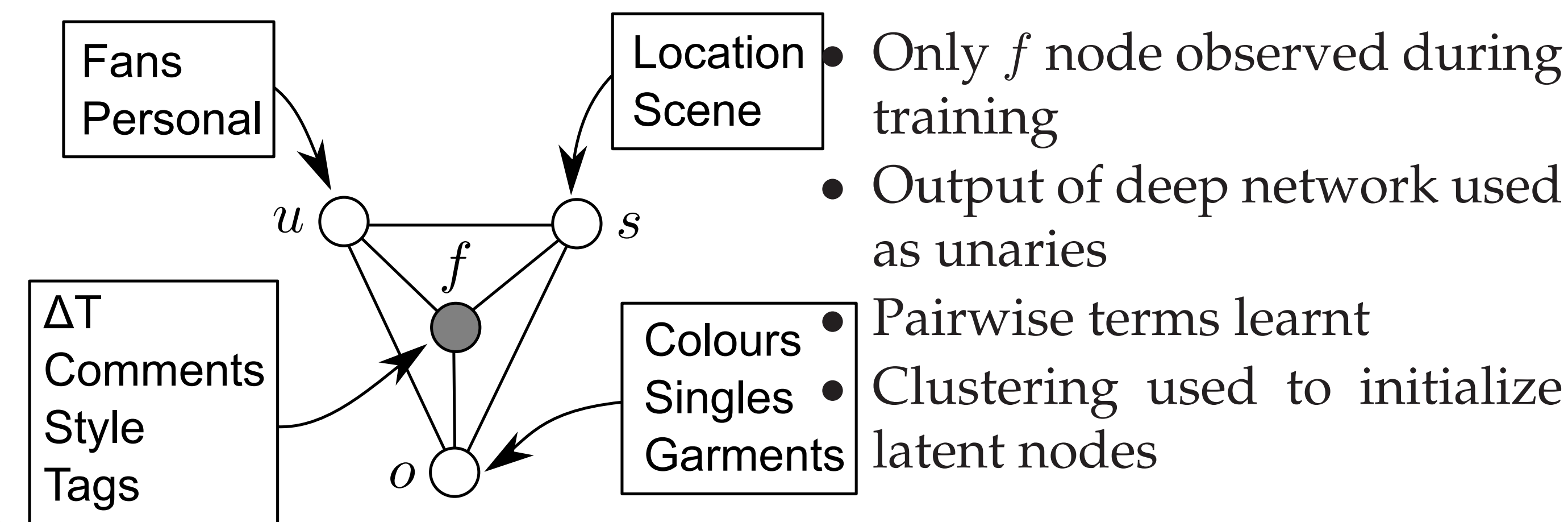
Feature	Dim.	Description
Fans	1	Number of user's fans
ΔT	1	Time between post creation and download
Comments	5	Sentiment analysis [4] of comments
Location	266	Distance from location clusters [3]
Personal	21	Face recognition attributes
Style	20	Style of the photography [1]
Scene	397	Output of scene classifier trained on [5]
Tags	209	Bag-of-words with post tags
Colours	604	Bag-of-words with colour tags
Singles	121	Bag-of-words with split colour tags
Garments	1352	Bag-of-words with garment tags

Deep Network for Feature Extraction

- Train four feature extractors jointly maximizing fashionability
- Afterwards, the four networks are used independently



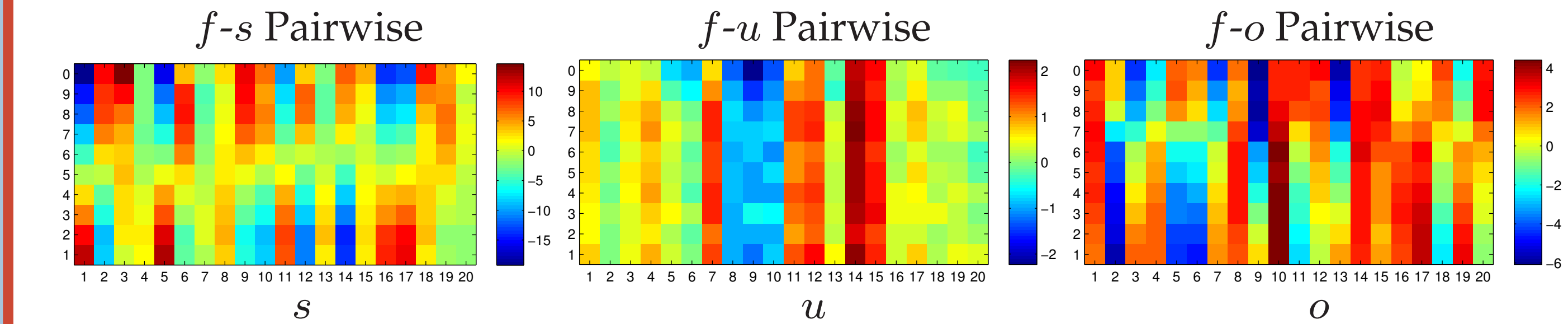
Modelling Fashion with a Conditional Random Field



RESULTS

- Latent states manually annotated

CRF Pairwise Terms

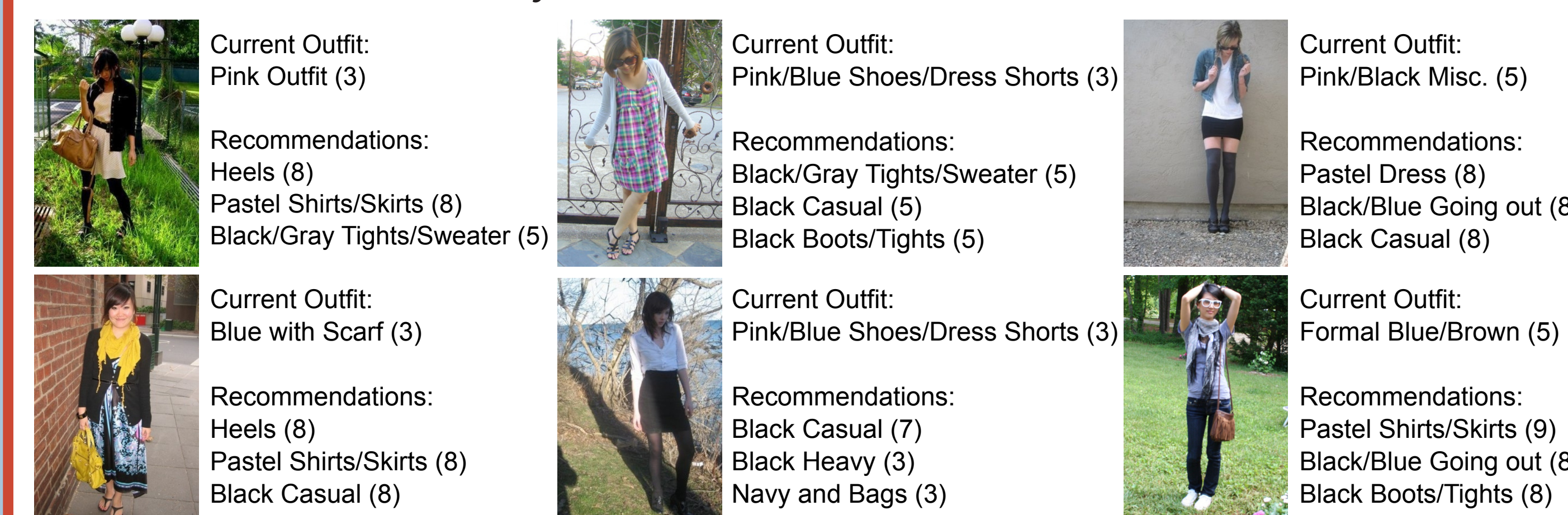


Sample Predictions



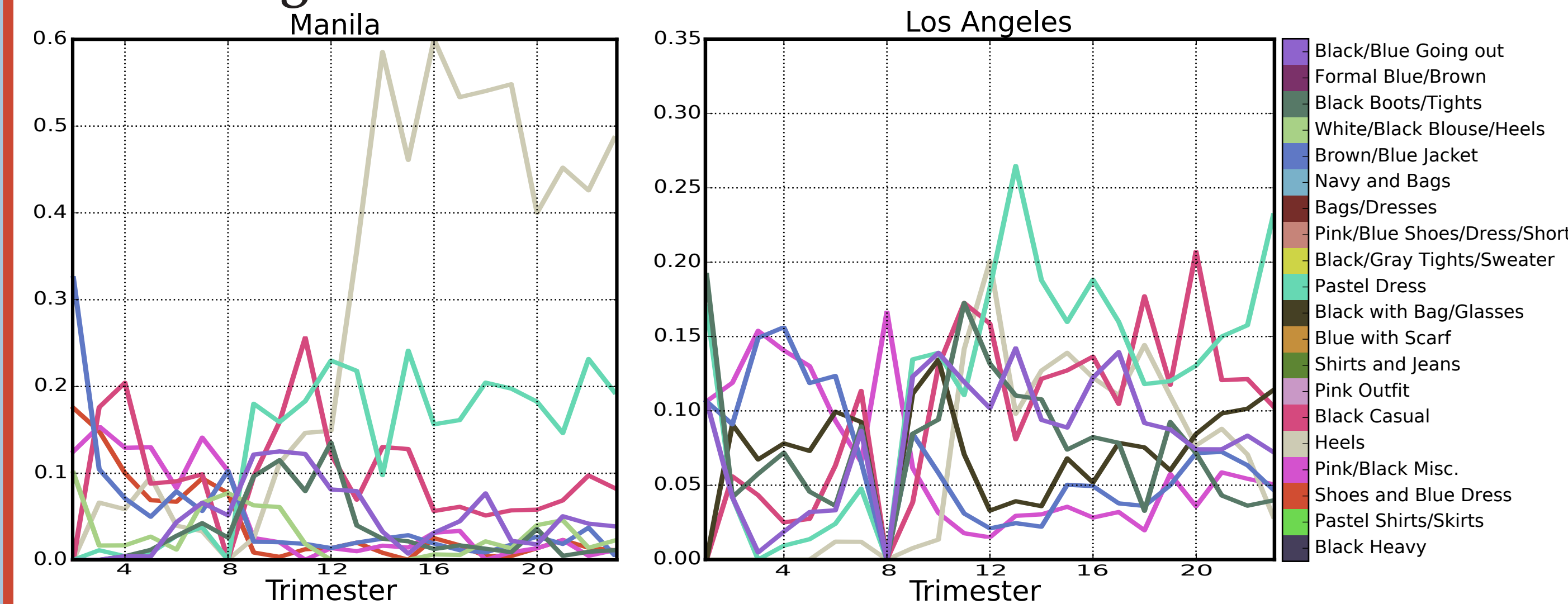
Outfit Recommendations

- Estimate setting and user state and find outfit state that maximizes fashionability



Three examples of outfit recommendations. Each example shows a 'Current Outfit' and a list of 'Recommendations' with associated scores. For example, for a 'Pink Outfit (3)', recommendations include 'Heels (8)', 'Pastel Shirts/Skirts (8)', and 'Black/Gray Tights/Sweater (5)'.

Visualizing Outfit Trends



Future Work

- Incorporate segmentation [2, 6]:

<http://www.iri.upc.edu/people/esimo/research/fashion/>

References

- [1] S. Karayev, A. Hertzmann, H. Winnemoeller, A. Agarwala, T. Darrell. Recognizing image style. In *BMVC*, 2014.
- [2] E. Simo-Serra, S. Fidler, F. Moreno-Noguer, R. Urtasun. A High Performance CRF Model for Clothes Parsing. In *ACCV*, 2014.
- [3] E. Simo-Serra, C. Torras, F. Moreno-Noguer. Geodesic Finite Mixture Models. In *BMVC*, 2014.
- [4] R. Socher, A. Perelygin, J. Wu, J. Chuang, C. D. Manning, A. Y. Ng, C. Potts. Recursive deep models for semantic compositionality over a sentiment treebank. In *EMNLP*, 2013.
- [5] J. Xiao, J. Hays, K. A. Ehinger, A. Oliva, A. Torralba. Sun database: Large-scale scene recognition from abbey to zoo. In *CVPR*, 2010.
- [6] K. Yamaguchi, M. H. Kiapour, T. L. Berg. Paper doll parsing: Retrieving similar styles to parse clothing items. In *ICCV*, 2013.

RESULTS - PREDICTING FASHIONABILITY

Model	Acc.	Pre.	Rec.	IOU	L1
CRF	29.27	30.42	28.69	17.36	1.46
Deep Net	30.42	31.11	30.26	18.41	1.45
No Metadata	19.63	17.06	17.47	8.31	2.31
Log. Reg.	23.92	22.54	22.99	12.55	1.91
Baseline	16.28	-	10.00	1.63	2.32
Random	9.69	9.69	9.69	4.99	3.17