ebay research labs

Large Scale Visual Recommendations
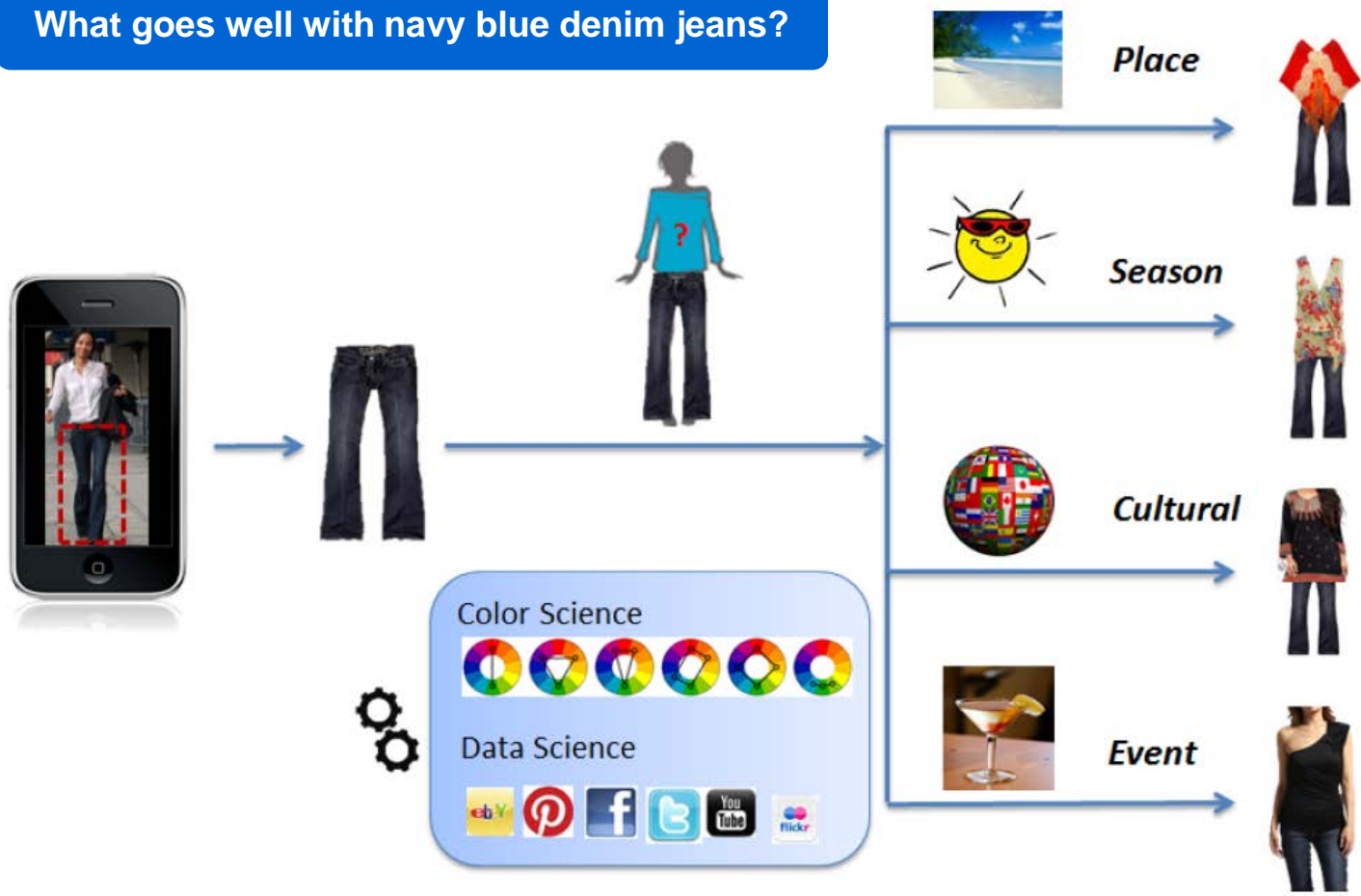# from Street Fashion Images

ake Visual Commerce Happen

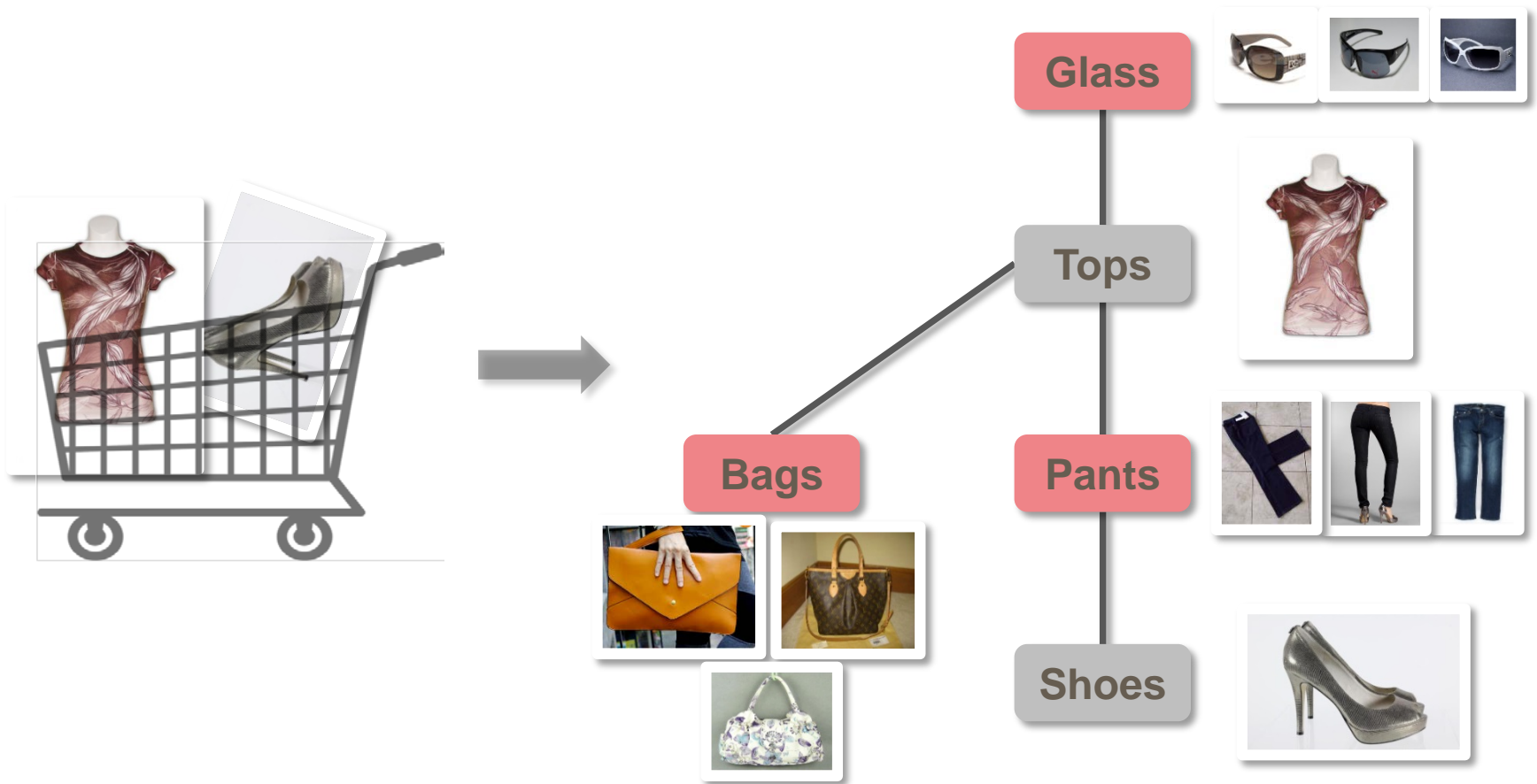Vignesh Jagadeesh, Robinson Piramuthu, Anurag Bhardwaj, Wei Di, Neel Sundaresan

Visual Recommenders – Context Based

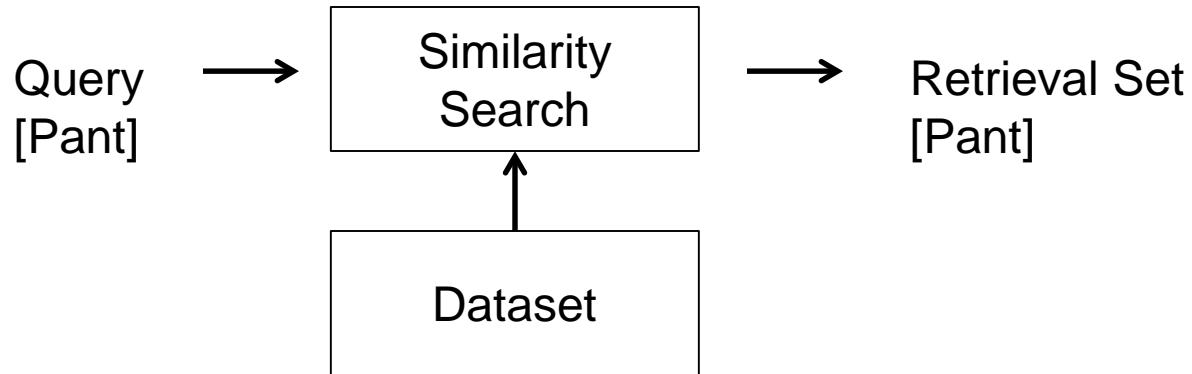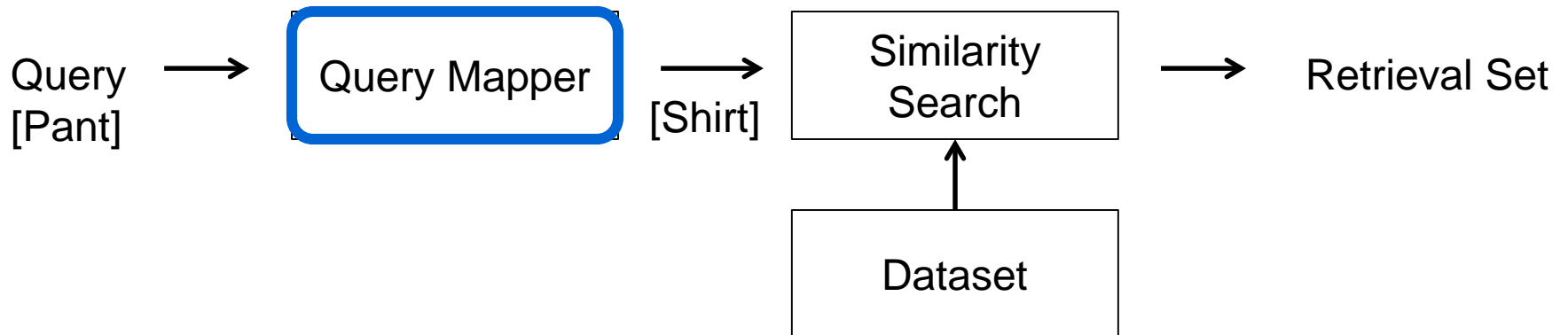**What goes well with navy blue denim jeans?**

Place

Season

Cultural

Event

Color Science

Data Science

Visual Recommenders – Complete the Set

This work addresses the estimation of "good" clothing combinations?

An Overview

Similarity Search
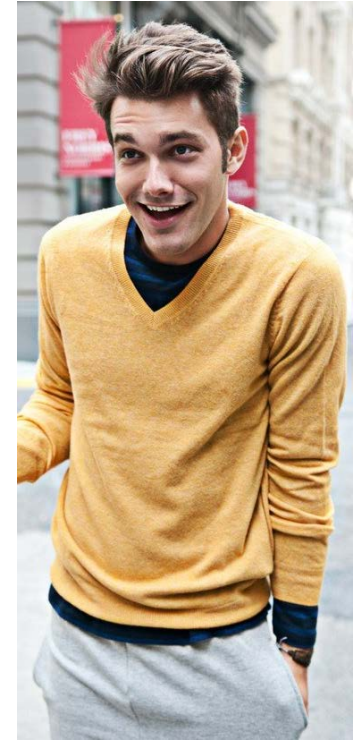
Query
[Pant] → **Similarity Search** → Retrieval Set
[Pant]

Dataset

Co-ordination Search

Query
[Pant] → **Query Mapper** → [Shirt] → **Similarity Search** → Retrieval Set

Dataset

Some combinations simply work

While others ….. not always

Learning "Good" Clothing Combinations from Visual Data

Street Fashion Blogs

Celebrity Clothing Styles

Fashion Shows

Social Networks
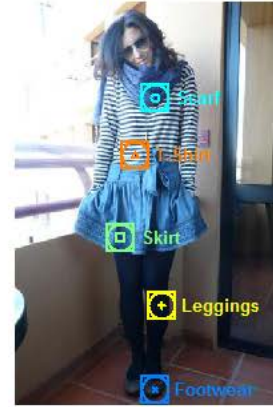
This work focusses on Street Fashion Images

Learning Phase

Apparel

a_1 a_2 a_3

Images
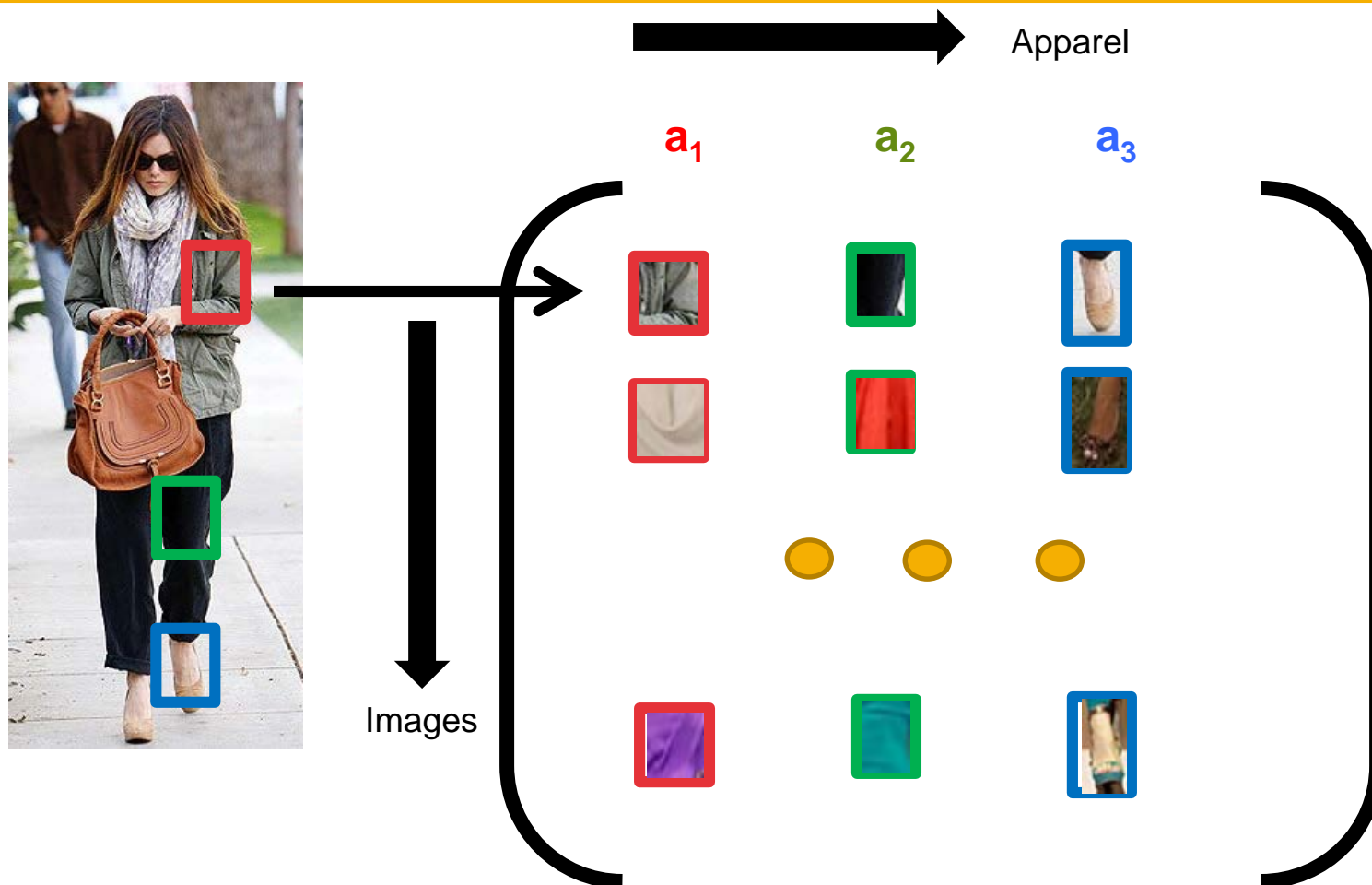
Goal is to estimate P(a_1, a_2, a_3)

Test Scenario

Query Skirt

Coordinating Tops

Goal is to estimate $a_1^* = argmax_{a1}\ P(a_1,\ a_3\ |\ a_2)$

The Intuition

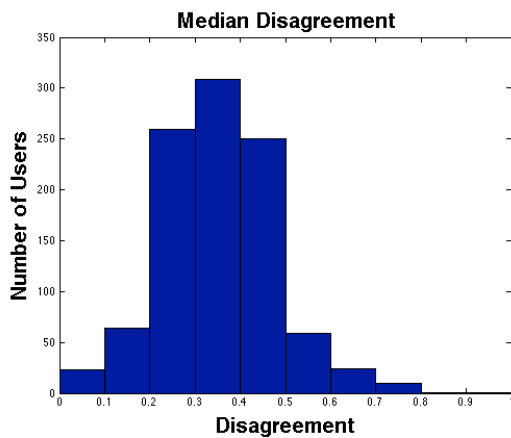Top Clothing **a₁**

Bottom Clothing **a₂**

M-Blue, M-Blue Green

D-Gray
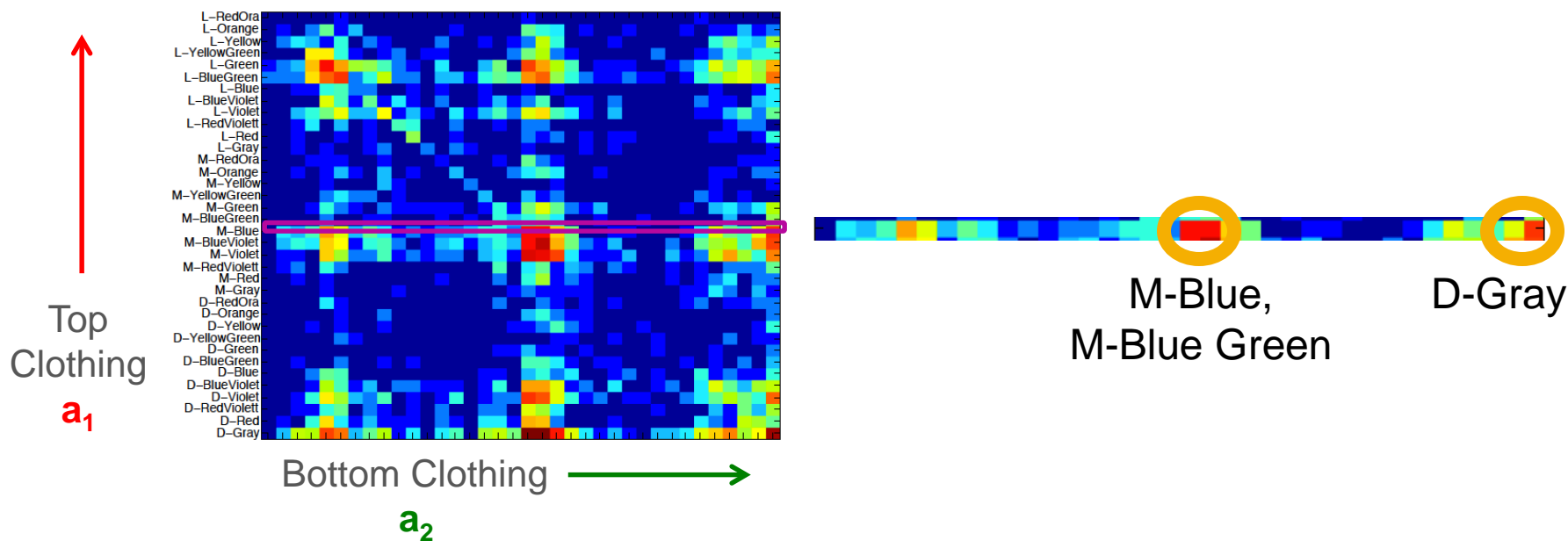
We propose a suite of algorithms, namely Deterministic Fashion Recommenders (DFR) and Stochastic Fashion Recommenders (SFR)

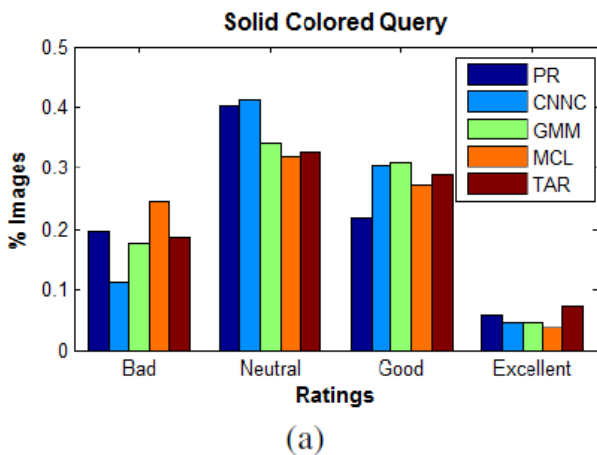DFRs are pretty rigid while SFRs have flexibility through randomization
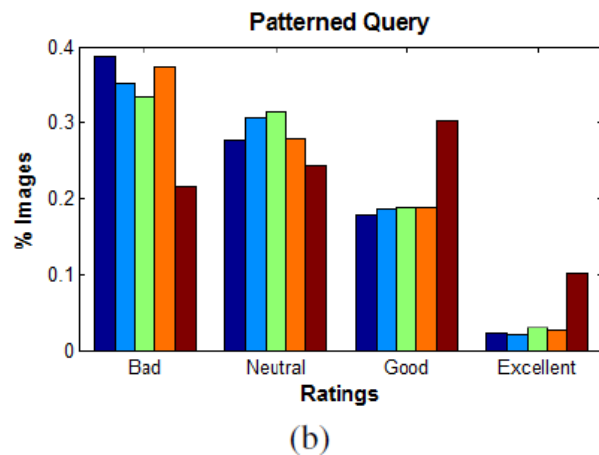
Subjective Evaluations

Retrievals rated on a scale from 0-3 by multiple human subjects

Only queries on which there is sufficient agreement retained for evaluation
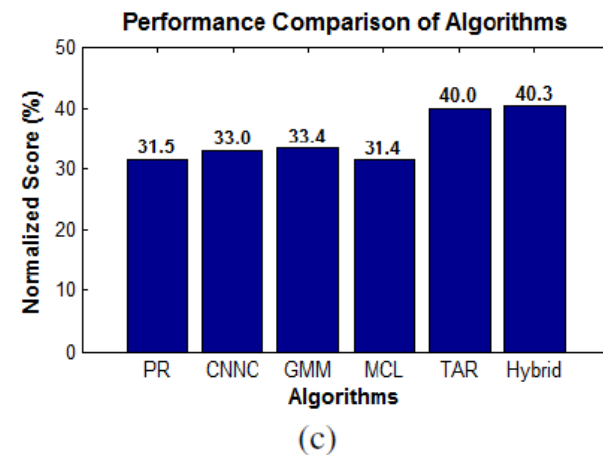
Performance

(a) Solid Colored Query

(b) Patterned Query

(c) Performance Comparison of Algorithms

Deterministic Recommenders perform best on solid queries
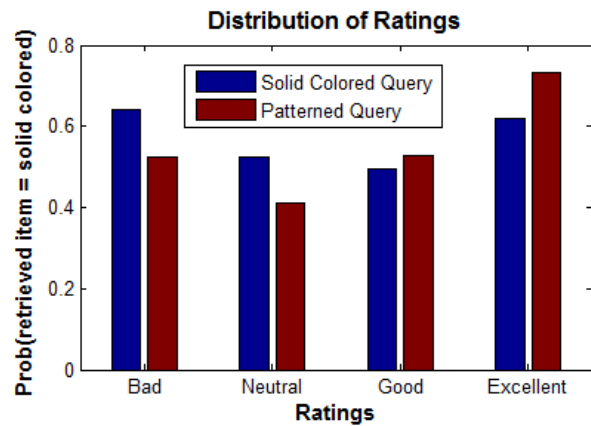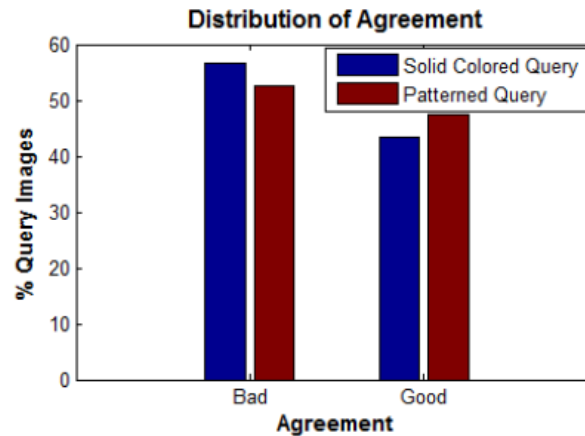
Stochastic Recommenders perform best on solid queries

Hybrid Recommenders perform best overall
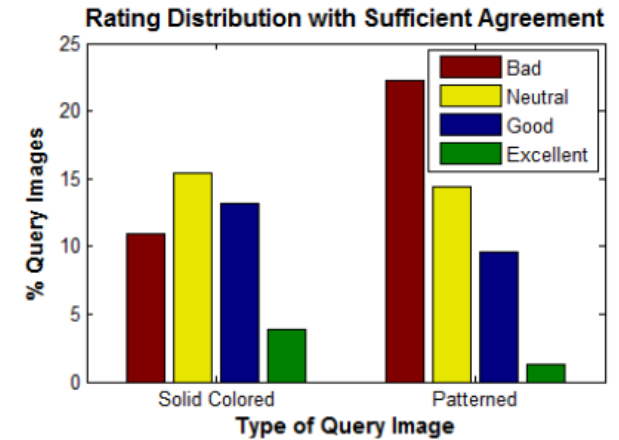
Solid vs Patterned Query

(a) Distribution of Ratings

(b) Distribution of Agreement

(c) Rating Distribution with Sufficient Agreement
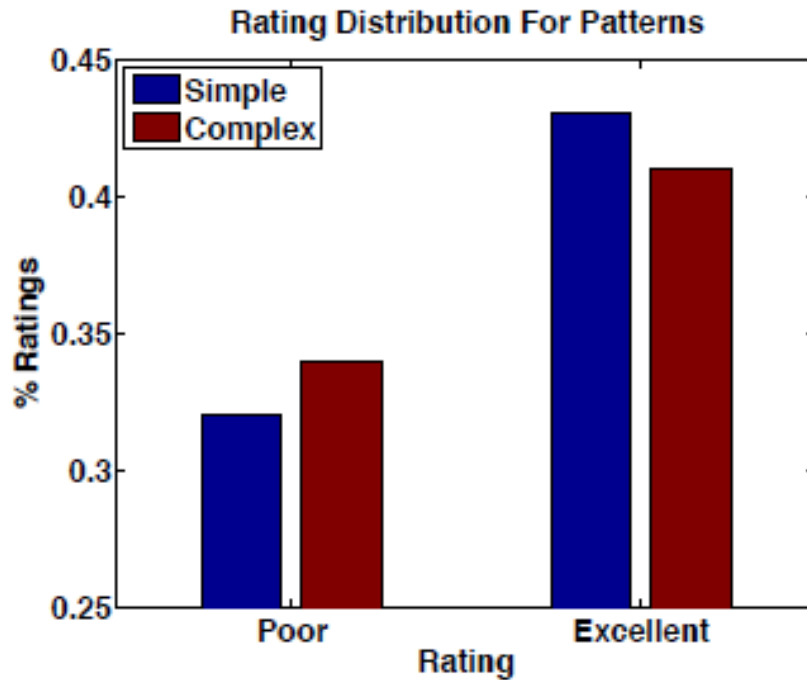
For patterned queries users like solid retrievals

Raters tend to agree more on patterned queries

However the message from agreement is patterned queries can do better!

Insight into patterns

Rating Distribution For Patterns

Simple patterns easier to get right

Cumulative Histogram of Rating Time
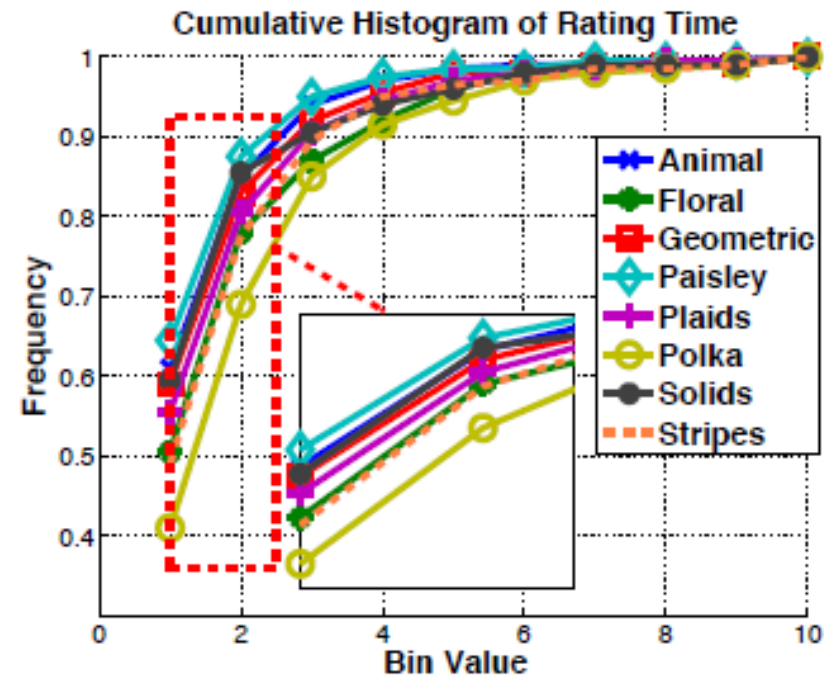
Simple patterns are quicker to rate too!

Conclusion

- Techniques for data driven visual recommendations
- Idea is to leverage scale of available visual datasets on the web
- Subjective experiments validate capability of algorithms proposed
- Ample scope for enhancing the fashion parsing, and retrieval systems

THANK YOU