Enabling Hyper Personalisation: Automated Ad Creative Generation and Ranking for Fashion E-Commerce

Sreekanth Vempati, Sruthi V, Korah T Malayil, Sandeep R

Myntra Designs, India

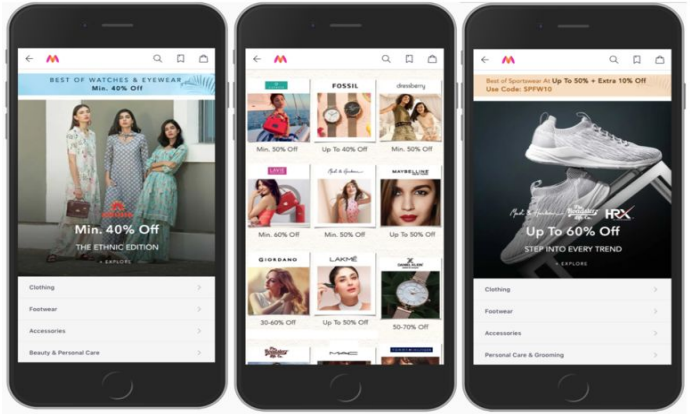
Myntra Background

- **Myntra** - Largest Fashion e-Commerce platform in India
  - Apparel, Footwear, Accessories, Home & Living
  - Product Categories : T-Shirts, Jeans, Dresses, etc.,

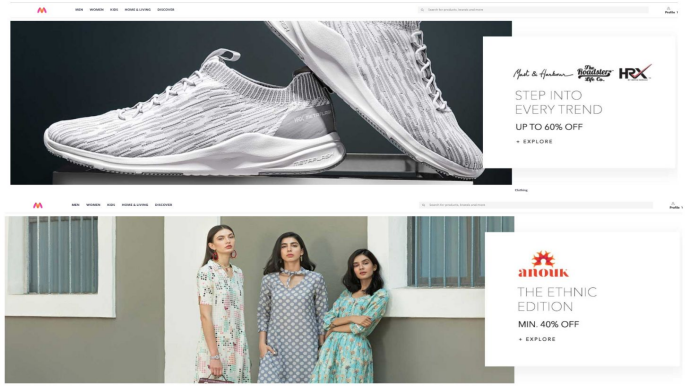
- Large catalogue of products:
  - ~650K live products in catalogue at any point of time and growing
  - ~70K new products catalogued monthly

Problem

- Homepage is the first touch point in customers journey.
- Banners/Ads on homepage are manually created leading to fewer number of ads.
- Automation can help in generating a large number of ads in a short period.
- A larger pool of ads can improve extent of personalisation



Example Banners/Ads on Myntra Mobile App (above) and desktop (below)



Approach

- **Automated Annotation of Images:** Tagging of People, Gender, Fashion articles, Scene etc.

- **Layout Generation:** Generating the best layout for the annotated image based on the highest energy score

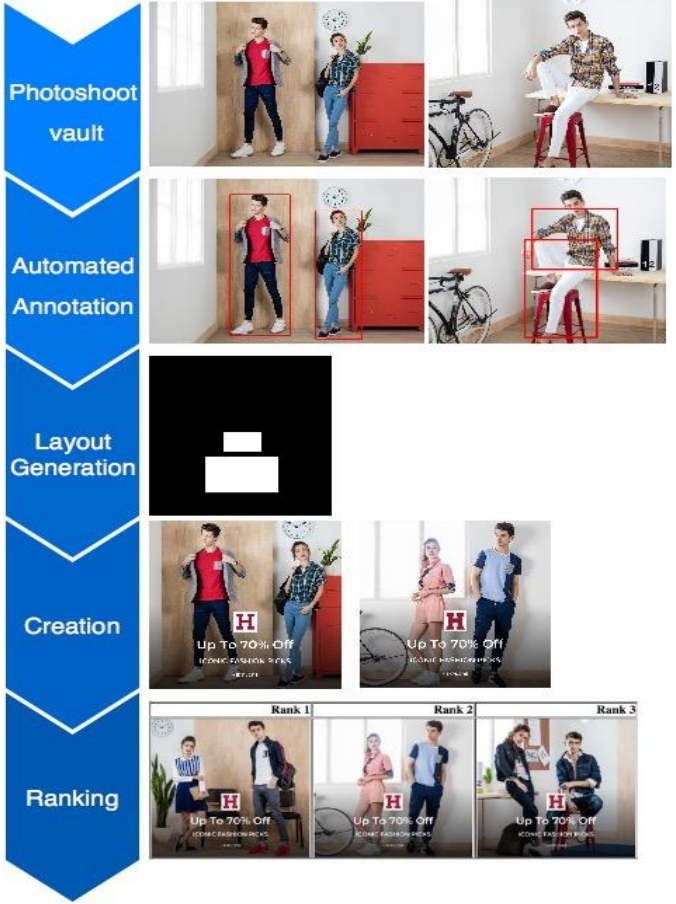
  Energy function **E** $E(X,\theta) = \sum_{i=1}^{n} w_i E_i(X,\theta)$

  X: Image, ***Θ***:element coordinates
  E_i : Individual Fitness function,
  w_i: Weights for each fitness score

  Fitness functions: Asymmetry, Overlap, Misalignment, Distance between design elements etc.,

- **Creation:** Automated cropping, Image post-processing and overlay of design elements

- **Ranking:** Finding the top banners based on historical CTR



Creative Generation - Fashion Category Detection

Creative Generation - Layout generation

Original Photoshoot Image

Resizing image

Image cropped to fit Banner

Generate Layout

Genetic Algorithm Output

Applying layouts

Ranking

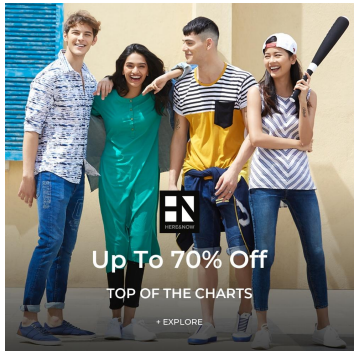
Creative Generation

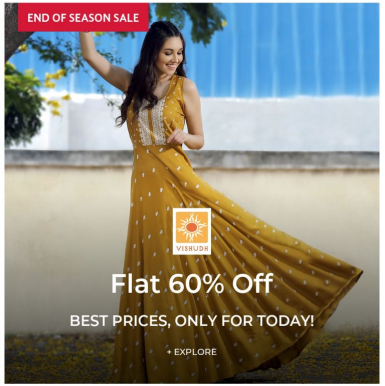
Given:

- Image
- Brand Logo
- Text Phrases
- Layout

(a) Original Image (b) Cropped Image (c) Gradient Applied (d) Logo Pasted (e) Text Added

Illustration





Designer vs. Automated Ads for same layout, image and text

Category level ads

Head Gear

For Her

Head Gear to add to your Summer Style

Shop Now

For Her

Head Gear to add to your Summer Style

Shop Now

Watches

For Him

Classic Watches: Made to Stand The Test of Time

Shop Now

For Him

Classic Watches: Made to Stand The Test of Time

Shop Now

Creative Ranking

The objective is to estimate a goodness score to rank generated creatives

Data: Historical Ads data used with CTR as the target label for goodness score.

Set of ad creative features used:

- VGG embeddings
- Neural Image Assessment scores (NIMA)
- Layout extracted features:
  - Overlapping Objects
  - Position Specific Features
  - Text in different quadrants etc.,
- Content : Fashion categories, gender, scene etc.,

Features (using Random Forest)	AUC	NDCG
VGG Embeddings	0.71	0.17
Layout Extracted Features	0.74	0.14
NIMA	0.71	0.24
NIMA + Layout Features	0.72	0.56
VGG + NIMA + Layout Features	0.71	0.22

Online A/B Test result:

- Total users divided in equal proportions
- Metrics improvement: 72% lift in CTR

Conclusions

- Proposed a method for ad creative generation and ranking
- Enables us to increase number of candidate ads fed to personalisation engine
- Online results show significant improvement gain
- As a future work, we can use Reinforcement learning for selection of ad creatives

Thank You!