

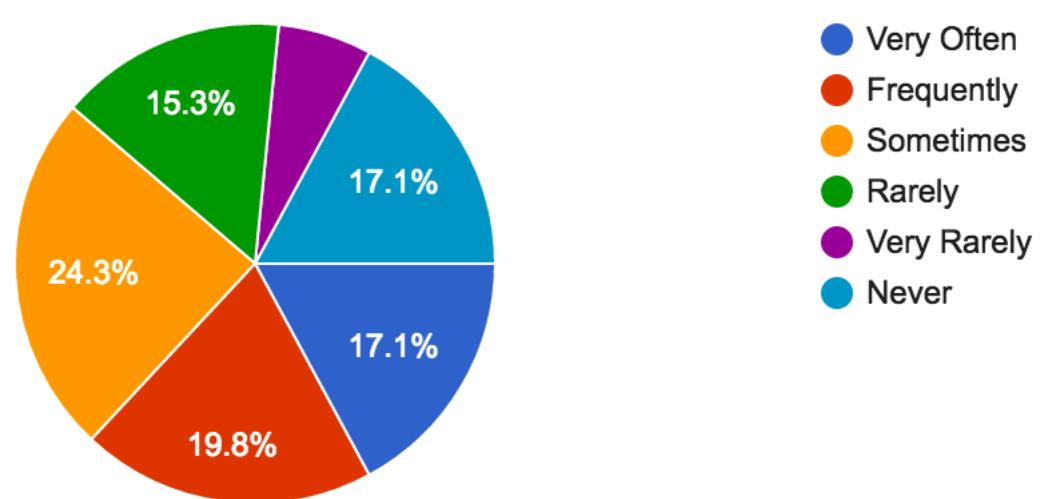
Analyzing and Recommending Filters from Image Category and Data

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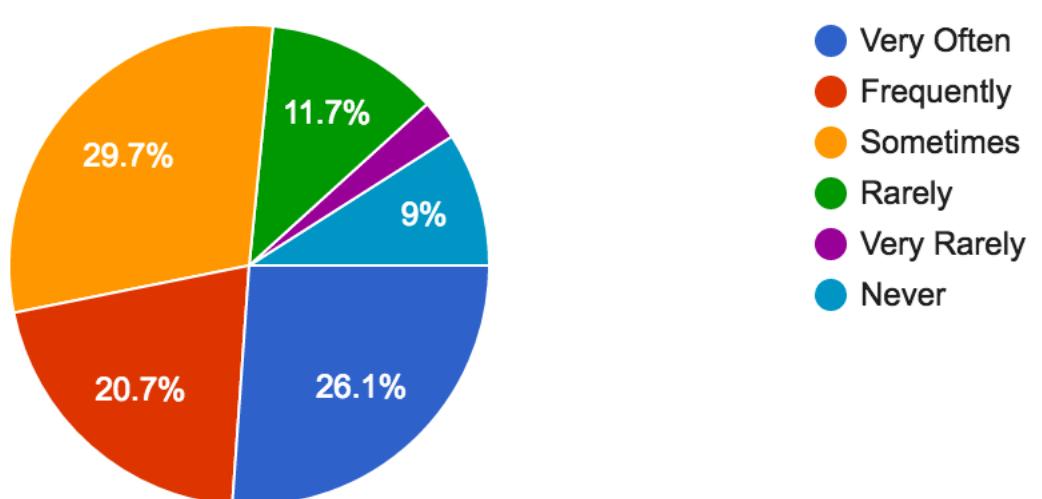
MOTIVATION

- Instagram does not recommend filters.
- People often choose a filter at random
- Recommendations enhance User Experience & Engagement

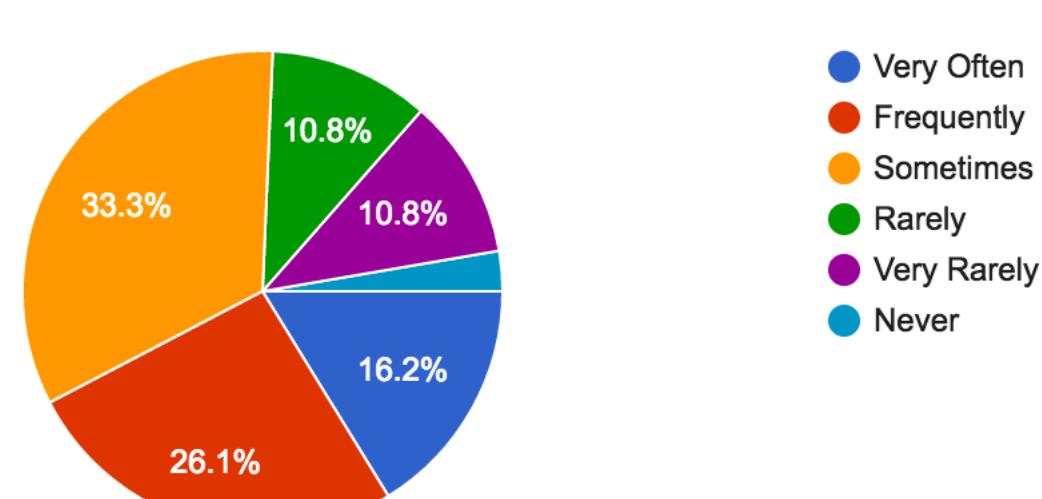
61% people apply Filters on photos before sharing



76% people get confused between various filters



77% people share photos on a social platform



APPROACH

Exploratory Analysis to identify features:

- Variation of filter usage by time of day, season
- Variation of filter usage by image class

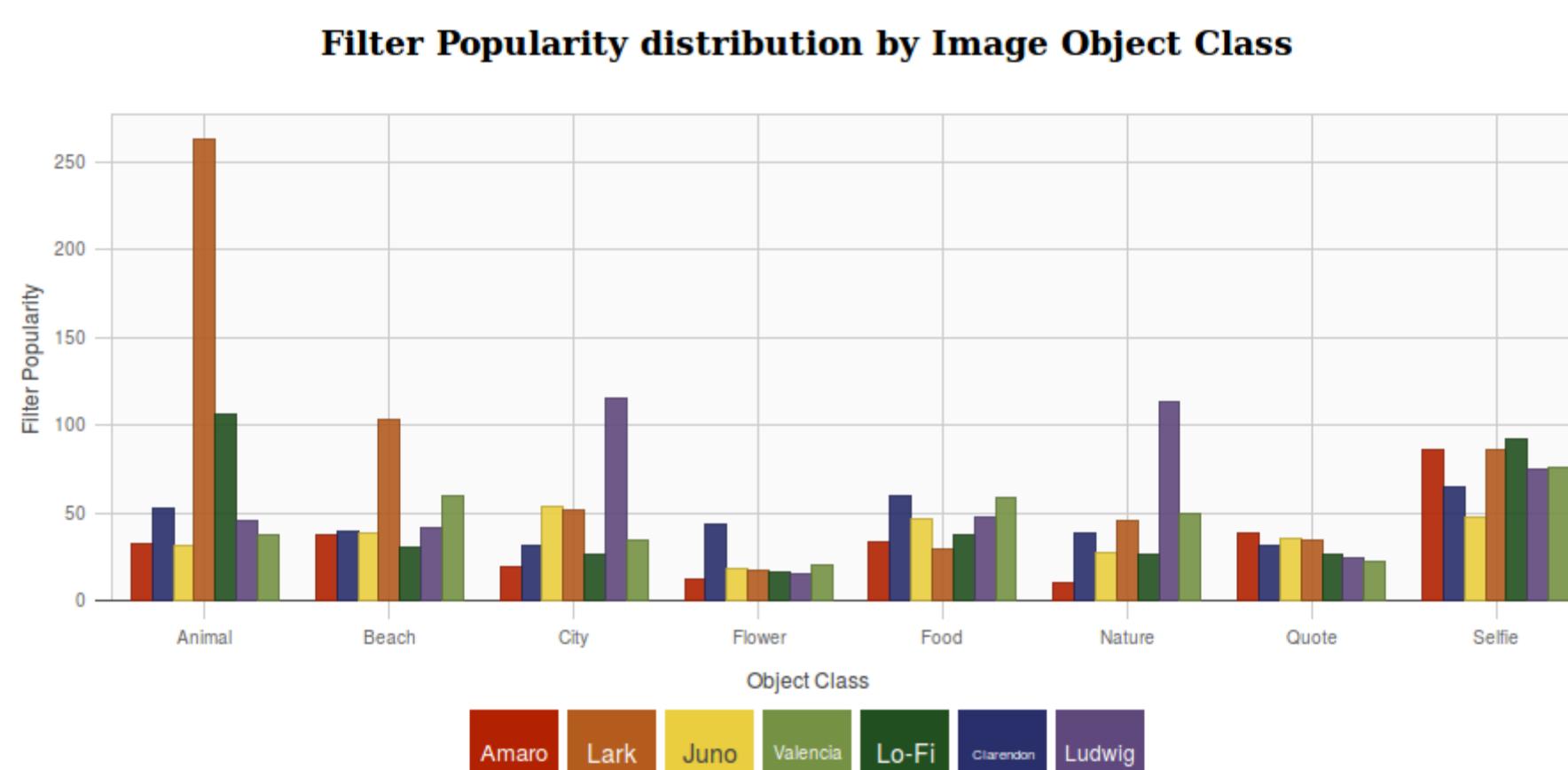


Image Class Classification

- Transfer Learning is used to leverage GoogleNet's learnt representations of images to classify images to one of our defined categories instead of the original 1000 class classification problem
- The last fully connected layer of the network is changed to output probabilities over 11 classes



Selfie: 80.28% Fashion: 18.5%



Food: 92.41% Abstract: 7.03%

DATA

- 2.4 million images
- Temporal: Spring, Summer, Fall, Winter
- Spatial: Washington, New York, Los Angeles, Atlanta
- 1.3 GB on disk

Collection:

Python scripts using the Instagram API running on EC2 instances



KNN based Recommender system:

Features:

Image Class, Season, Day of week, Time of Day

Distance metric: Euclidean distance

$$d(x_i, x_j) = \sqrt{\sum_{k=1}^N (x_{i,k} - x_{j,k})^2}$$

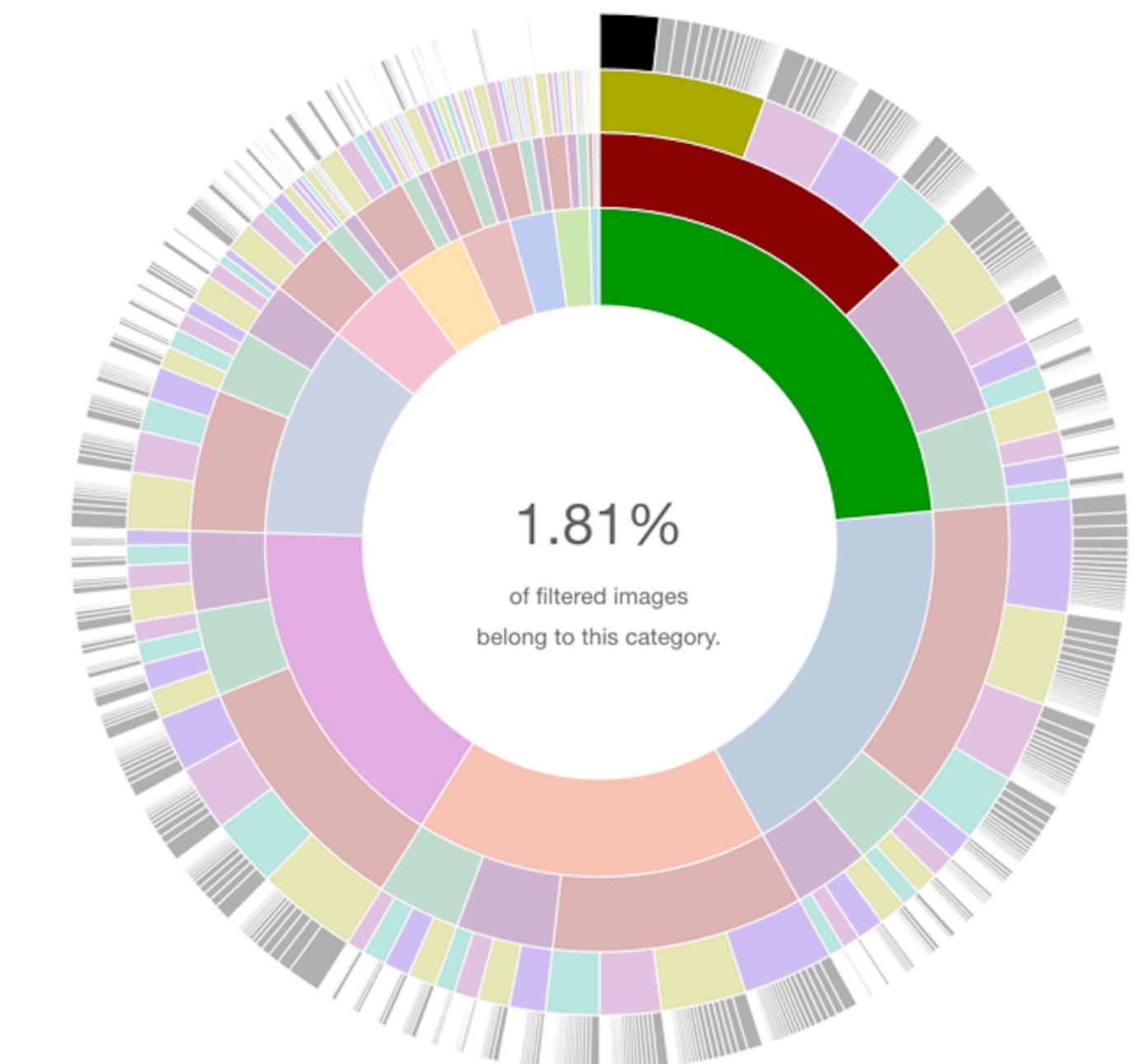
Voting function:

Score = $(\alpha \times \text{likes} + \beta \times \text{comments}) \times \text{penalty}$

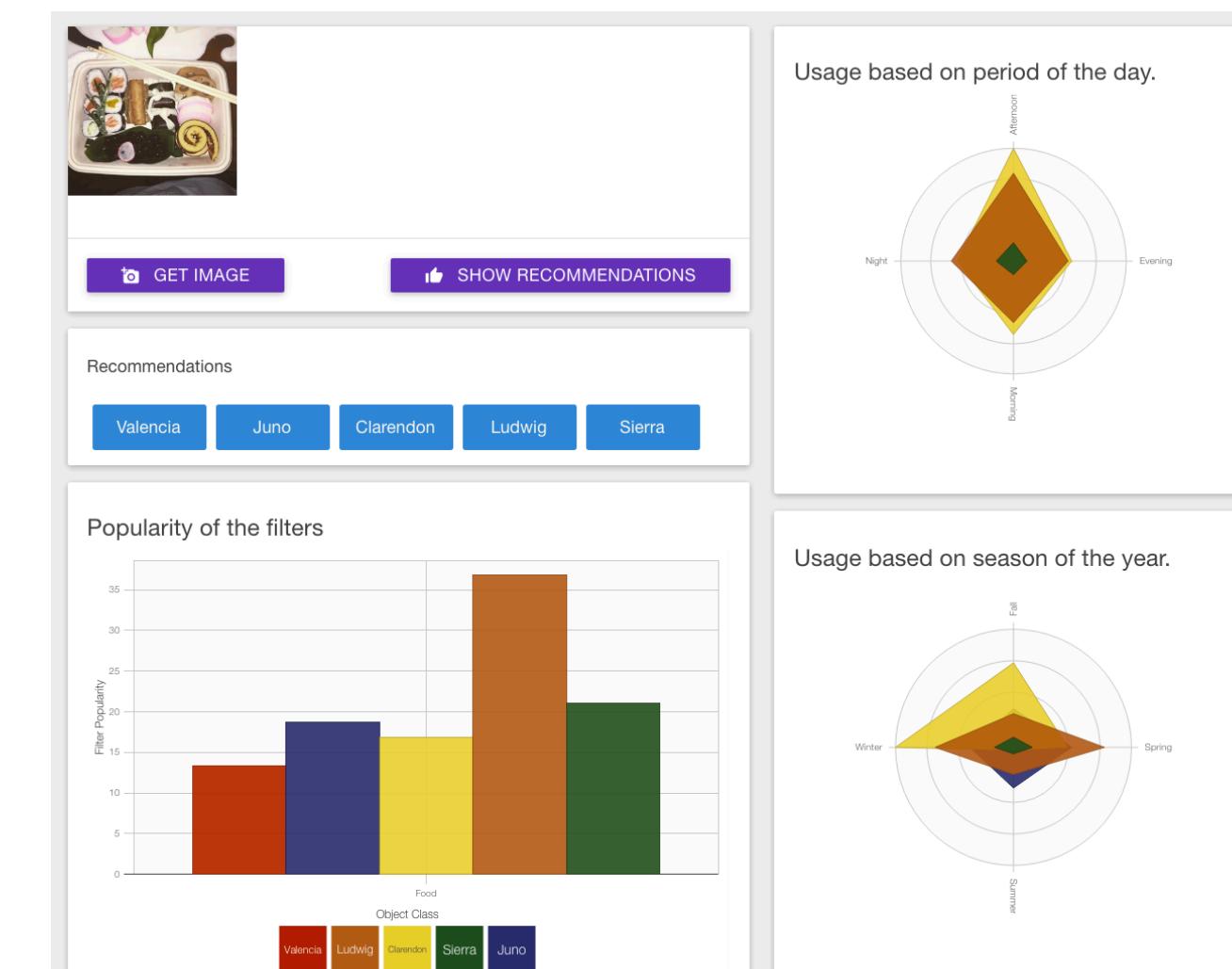
Where α and β are hyperparameters and penalty is a fixed value that marginally penalizes filters based on their order in the Instagram UI

EXPERIMENT AND RESULTS

abstract > winter > afternoon > Clarendon 1.81%



Overall visualization of all filters over image class, season, time of day



Recommendation User Interface with informative visualizations

User Survey:

- 128 user responses (Friends, colleagues, relatives)
- Results match well with our recommended filters

