Aesthetic Quality Classification of Photographs Based on Color Harmony

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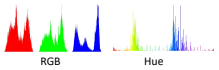
I. Purpose

Automatically classifying aesthetic quality whether a photo elicits a high or low level of affection in a majority of people



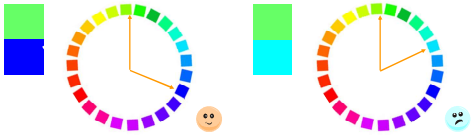
Color harmony: a significant influence on their perceived quality

Existing aesthetic quality classification methods
- Ignore color harmony
- Use a global color histogram features

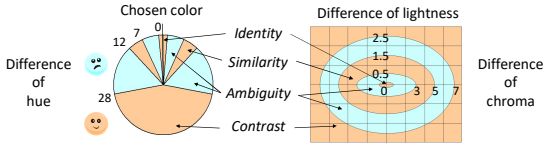


II. Existing color harmony models

- Handle a simple color pattern with a few color
- Evaluate a relative value to a chosen color
- Based on psychological experiments



Moon-Spencer model

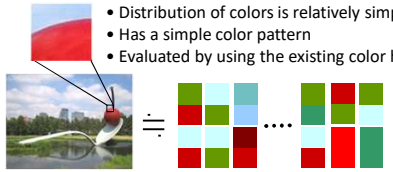


Cannot be used to asses photos with complicated color distributions

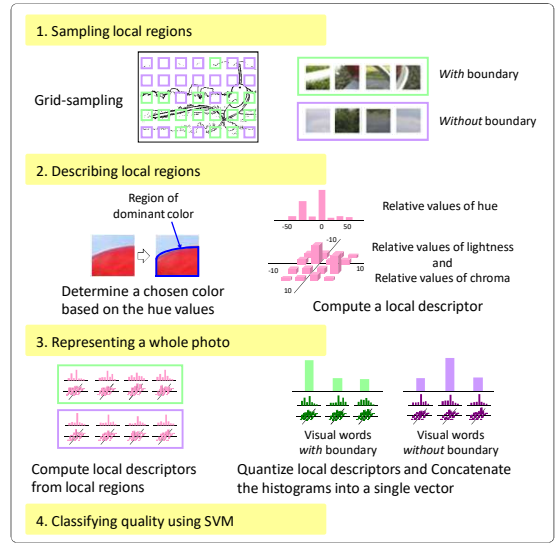
III. Bags-of-color-patterns

Classifying aesthetic quality on the basis of the frequency of appurtenance, *i.e.*, the histogram of color patterns

Local region:
- Distribution of colors is relatively simple
- Has a simple color pattern
- Evaluated by using the existing color harmony model



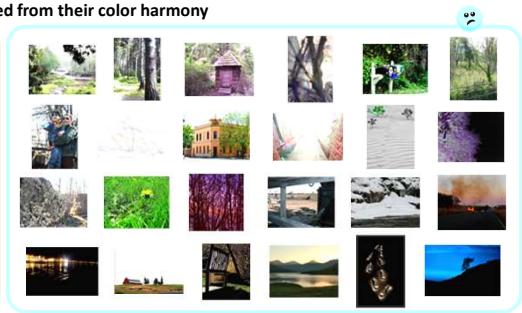
Assumption:
A photo is a collection of simple color patterns



IV. Results

Examples of photos classified from their color harmony



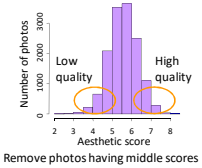


DPChallenge

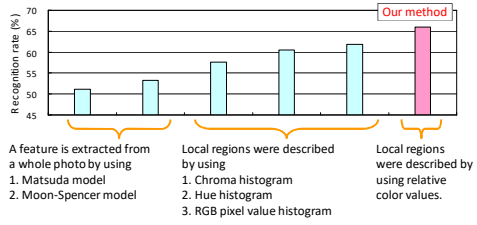
- We collected 124,664 photos in 14 categories
- About 200 people gave a aesthetic score to more than 4,000 photos.
- The top and bottom 10% of scores were deemed the high- and low-quality photos.



Histogram of the aesthetic score given to each photo



Remove photos having middle scores



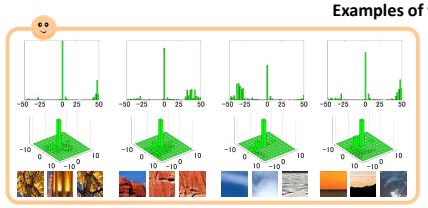
A feature is extracted from a whole photo by using
1. Matsuda model
2. Moon-Spencer model

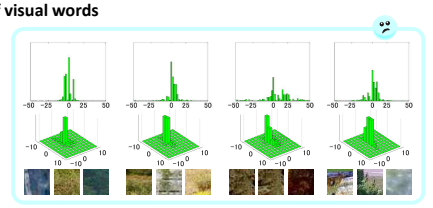
Local regions were described by using
1. Chroma histogram
2. Hue histogram
3. RGB pixel value histogram

Local regions were described by using relative color values.

Our local and relative feature outperforms all other features.

Examples of visual words





High (Low) quality photos contains more high (low) quality visual words than low (high) quality photos.