Photobox Final Presentation

Fa20 – Human AI Interaction

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AGENDA

Early Works

Switch Focus

Method

Solutions

Model Card
Early Works
Early Works

Initiation: Managing photos in mobile devices is getting harder

- Manual vs AI Driven
- Cumbersome manual annotation
- Loss of flexibility and personalization
- Algorithm transparency

Features want to improve the most:
- Photo search system
- Manual classification/tag
- Similar photo detection

What users are expecting:
- Improved searching system
- Smart tags of events and activities
- Remove similar pictures
Early Works

Design:
- Intelligent tag recommendation with personalized options
- Manual correction for algorithm
- Similar photo detection and delete recommendation
Switch Focus
Switch of Focus

- Focus on features that differentiate from other apps: photo recommendation system
- Second round survey
- Interviews
Switch of Focus

- Multiple photos for the same scene: 65%
- Hard to select the most satisfying photo: 73%
- Smart feature helps with the situation: 94%

- Similar photo detection and deletion
- Photo recommendation for social platform
Method
Method

Identify potential issues
- Recommendation fairness and ethics
- Data limitation
- Transparency and explanation

Build up solutions
- Developing algorithm
- Interaction design
Method - Potential Issues

Recommendation fairness and ethics:
1. Content (inappropriate content or negative popular)
2. Opacity (black box of the recommendation system)
3. Fairness (popularity influence)
4. Social effects (lack of exposure to other viewpoints)

Data:
User info influence, various popularity scores, bias

Transparency:
how the algorithm works, what would be assessed in users’ pics, how does the algorithm come up with the result
Solution - Design
Solution - Design

PERSONA CARD

Goals - Interest

- **Add tags to photos**
  Custom annotate photos, different classification methods for the same photo.

- **Easy to find specific photos**
  Use tags and albums to have more accurate search and find photos faster.

- **Algorithm transparency**
  Understand what data the application will collect and how to use it.

- **Detect similar photos**
  AI helps to detect similar photos, making it easy to organize albums.

- **Recommendation of best photo**
  AI makes recommendations for the best photos based on image quality and social media data.

Motivations

- Loneliness
- Entertainment
- Curiosity
- Relationship
- Hack Up

 Personality

- Introvert
- Extrovert
- Analytical
- Creative
- Loyal
- Rude
- Passive
- Active

FANCY NANCY

“Beauty Vlogger”
22 yrs old (Gen Z)

DEVICES

- Phone
- Laptop
- Tablet

ATTITUDE

- Opinion leader
- Independency
- Uniqueness/Bold
- Socially Influential
1. Taking pictures.

2. It’s difficult to find the best photo in many similar photos.

3. Photobox helps you to detect similar photos and give a recommendation of the best photo.

4. Upload the photo recommended by AI to social media and get some good feedback.
High-fidelity & Prototype
Demo
Solution - Algorithm
Solution: Photo Popularity Prediction Algorithm

Problem to solve:
Given a couple of images (and based on users’ profile data), we can recommend one of them which will possibly receive more reactions on social media.

Idea:
Train an algorithm to predict the “Image Popularity” of given images. Then, we can compare their “Image Popularity” and recommend the best one to the user.

Data Source:
We use a Flickr dataset shared by 2020 Image Popularity Prediction Challenge.

Models:
As a regression question, we plan to try Gaussian Naive Bayes, Simple Linear Regression, and Random Forest
Solution: Algorithm - Flickr Dataset

Our Target "Image Popularity":
Social image popularity is a score of the level of engagement achieved by pictures shared through social media platforms

<table>
<thead>
<tr>
<th>User Related Data</th>
<th>Image Related Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>number of contacts</td>
<td>number of albums</td>
</tr>
<tr>
<td>if the user is a professional photographer</td>
<td>number of groups</td>
</tr>
<tr>
<td>number of photos</td>
<td></td>
</tr>
<tr>
<td>number of groups</td>
<td></td>
</tr>
</tbody>
</table>
Solution: Algorithm - Features

Besides Flickr dataset, we extract features from the images themselves:

1. Histograms
2. Histograms of Oriented Gradients
3. Object Recognition by imageAI
Solution: Algorithm - Data Issues and Bias

Here are the (potential) issues and bias we found:

1. The data source does not provide a clear definition of “Image Popularity”
2. The users own popularity can make huge impacts:
   Justin Bieber or somebody
3. Not sure about the reasons why the images have obtained higher “Image popularity”:
   a great photography or a funny meme
4. We need more clues about the groups:
   general popular groups vs focus groups
Solution: Algorithm - Model Performance

![Graph showing mean average error vs. max depth with different n estimators.](image1)

![Bar chart comparing mean absolute error for different models.](image2)
Model Card
Questions?