Oh, Andrea. The Battle of the Book Cover/ https://tinyurl.com/y5hdwv9a

Everyone judges a book by its cover

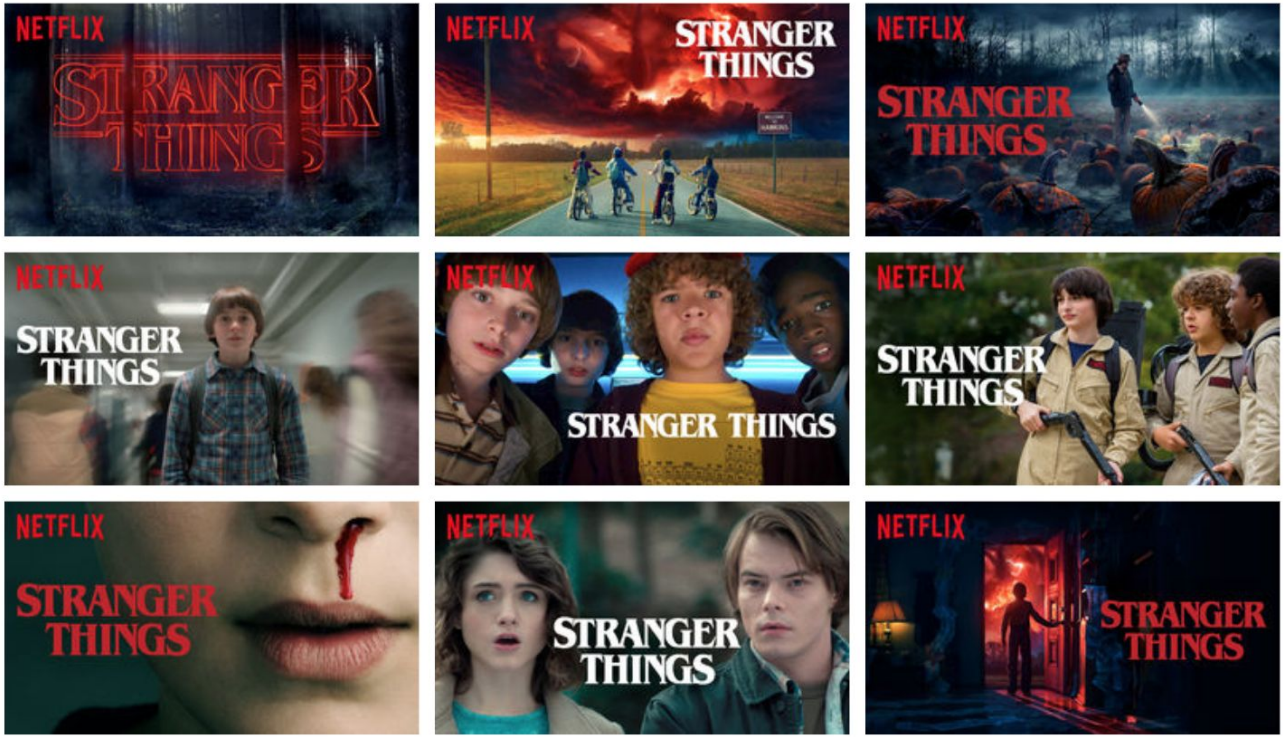
First interaction with the would-be reader

Often hire third-party designers:

"A book cover must first catch the eye of the reader, or else the book will never be opened. We think good design must be visually seductive—that might mean beautiful, or interesting, or weird, or new—but without enticing form, there is no entry point to content" - Anne Jordan and Mitch Goldstein

Jordan, Anne and Goldstein, Mitch. Uncovering the Cover Design. 2015. <https://tinyurl.com/yy4qmcjy>

Netflix, why do you get different thumbnails?



Chandrashkar, Ashok et al. Artwork Personalization at Netflix. 2017. <https://tinyurl.com/y7pl6jcd>

Netflix, why do you get different thumbnails?

"If the artwork representing a title captures something compelling to you, then it acts as a gateway into that title and gives you some visual "evidence" for why the title might be good for you. The artwork may highlight an actor that you recognize, capture an exciting moment like a car chase, or contain a dramatic scene that conveys the essence of a movie or TV show. If we present that perfect image on your homepage (and as they say: an image is worth a thousand words), then maybe, just maybe, you will give it a try."

Personalized recommendations and personalized artwork.

Previously attempt to find "best" thumbnail across all users with minimal success.

Chandrashkar, Ashok et al. Artwork Personalization at Netflix. 2017. <https://tinyurl.com/y7pl6jcd>

Goal: Suggestions or improvements

We propose using modern machine learning techniques to learn successful covers for books.

By doing so, we aim to discover whether certain elements of book covers are related to the eventual success of a book.

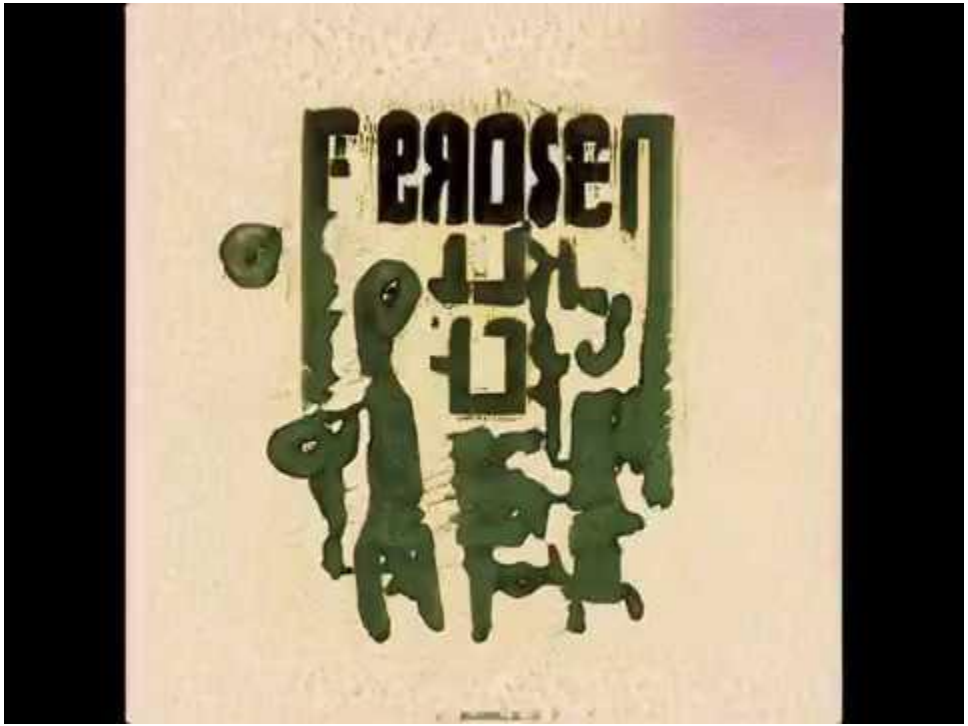
More importantly, knowing this information, can we generate suggestions to improve cover design?

Can we actually judge a book by its cover?

Why not generate a book cover?

Previous research intended to generate novel convincing album art covers given the lyrics of an album using generative adversarial networks to minimal success.

Title cannot be generated well, and further research is needed for 2d object extraction.



Hepburn, Alexander et al. Album Cover Generation from Genre Tags. 2017. <https://tinyurl.com/y2jexz8o>

Latent Patterns in previous work

Convolutional Neural Networks were used to learn categories of books simply based on cover. While the clustering was not perfect, we do see common traits among shared genres. This points to latent context we can rely on to build our model.

Iwana et al. Judging a Book by its Cover. 2017. <https://tinyurl.com/ppvbee3>

Data

Amazon review data: 51,311,621 reviews for 2,935,525 books

```
"[OVERALL RATING]","[VERIFIED]","[REVIEW TIME]","[REVIEWER ID]","[AMAZON INDEX (ASIN)]","[STYLE]",
"[REVIEWER NAME]","[REVIEW]","[SUMMARY]","[UNIX REVIEW TIME]"

"[CATEGORY]","[DESCRIPTION]","[TITLE]","[BRAND]","[RANK]","[ALSO_VIEW]","[MAIN_CATEGORY]","[PRICE]",
"[AMAZON INDEX (ASIN)]",
```

Categorized Amazon Book Cover dataset: 207,572 books in 32 classes

```
"[AMAZON INDEX (ASIN)]","[FILENAME]","[IMAGE URL]","[TITLE]","[AUTHOR]","[CATEGORY ID]","[CATEGORY]"
```

Project Gutenberg

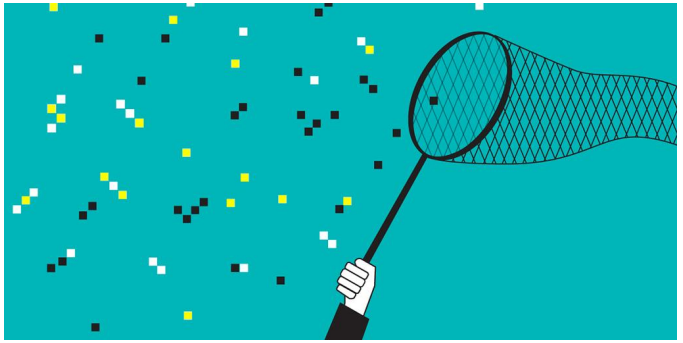
```
"[UNSTRUCTURED FULL TEXT]"
```

Methods

1. Data collection and cleaning and clustering

2. Image feature extraction
    a. Traditional image processing to extract predefined features
    b. CNN
3. Recommendation generation
    a. K-nn
    b. Decision tree regression

Data Collection and Cleaning



- Book Metadata and Reviews can be downloaded directly.

- The Metadata contains a link to images hosted by Amazon, we'll need to write a job that downloads each image file to be further processed.

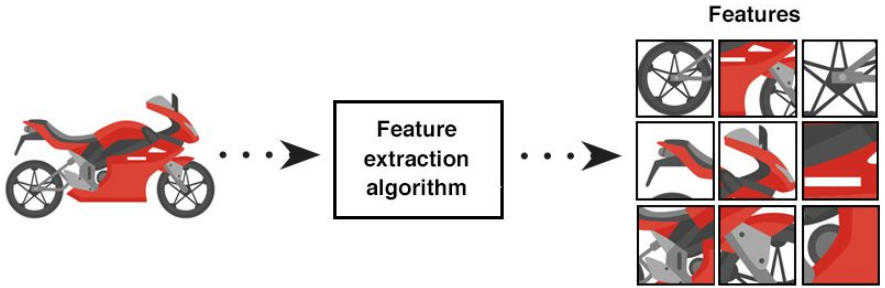
- We may need to do further image processing - for example, removing white space around the borders of each image and normalizing all images to be the same size.

Image Feature Extraction

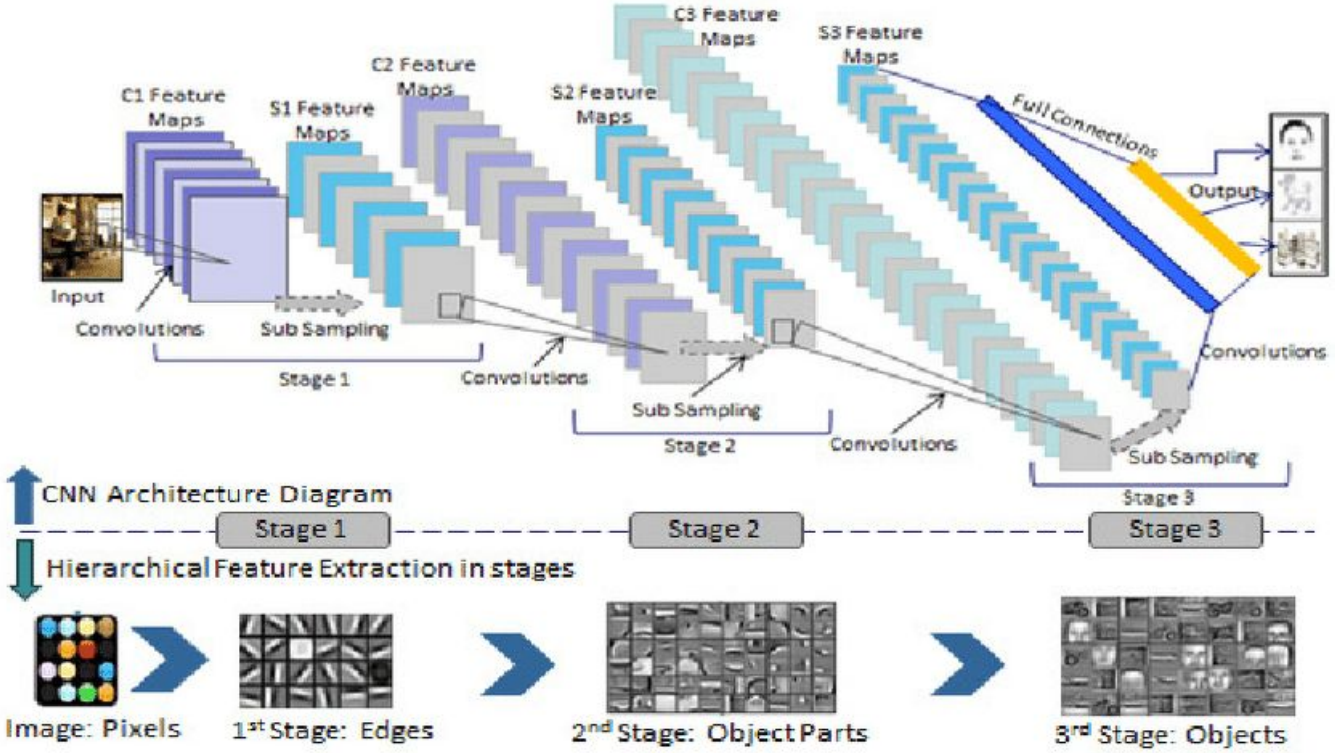
We will explore both traditional generating features and training a CNN to automatically select features.

Manually generated features may include those based on the cover's:

- Color (most common color, how many colors, etc.)
- Text (content of text, size of font, etc.)
- Blobs (recognizable shapes, amount of separate objects, etc.)



Convolutional Neural Networks

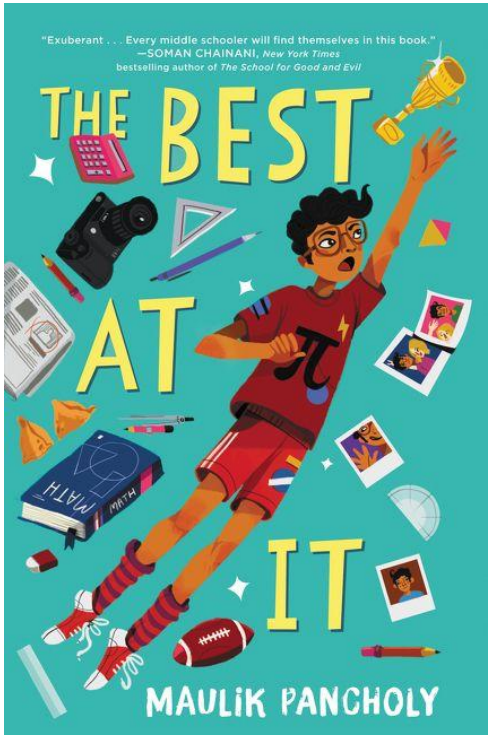


Katole et al. Hierarchical Deep Learning Architecture For 10K Objects Classification. 2015. <https://tinyurl.com/y25de298>

Recommendation Generation

Based on our extracted features (traditional or CNN-generated) we can find similar images by looking for images with similar features.

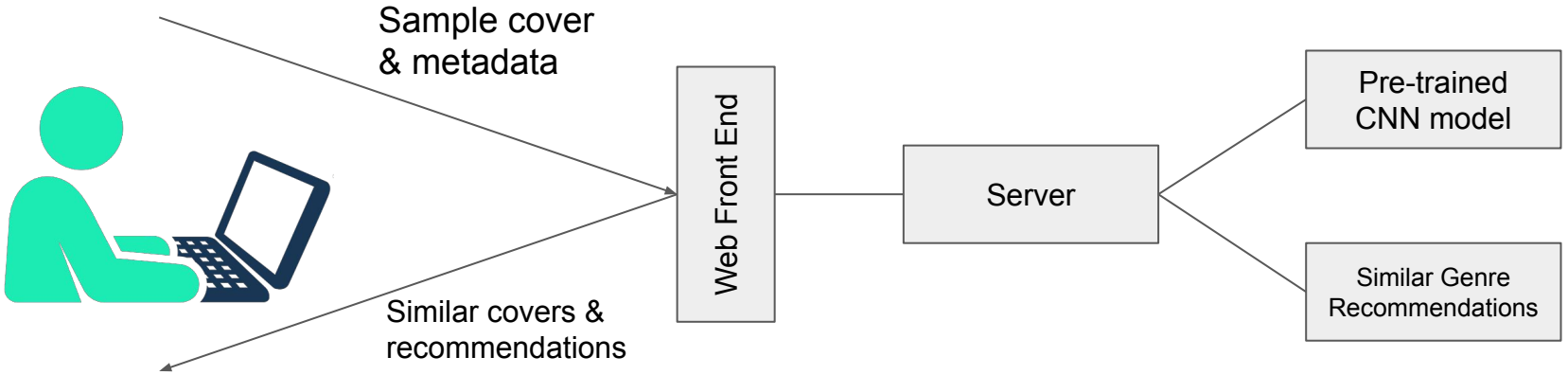
We can correlate this collection of images with an average review score out of 5 stars to suggest what we think the book related to this book cover might be rated.



We can also suggest tweaks to the cover that would change the book cover to be in a category that has higher average reviews.

System

Web app recommender system



Schedule

Week 1: gather data, exploration, visualization, scrape covers

Week 2: given a book cover, get related book covers

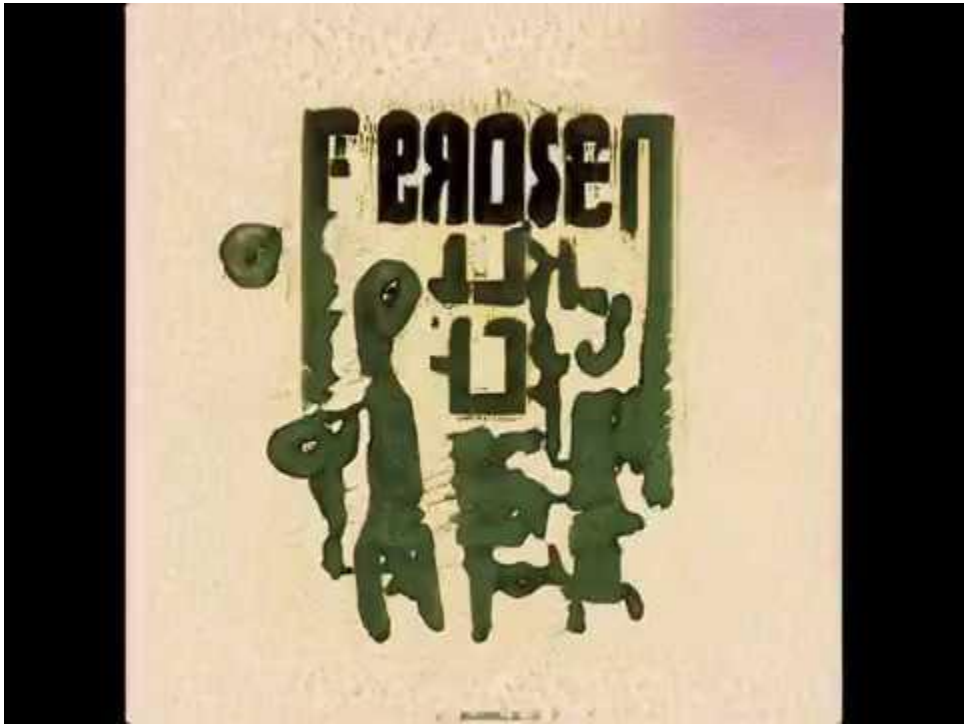
Week 3: simple web service to gather related book covers

Week 4: CNN model for feature extraction, augment related book cover

Week 5: Feature extraction, suggestion service

Week 6: Profit

Any Questions?



Hepburn, Alexander et al. Album Cover Generation from Genre Tags. 2017. <https://tinyurl.com/y2jexz8o>

Thank you!

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