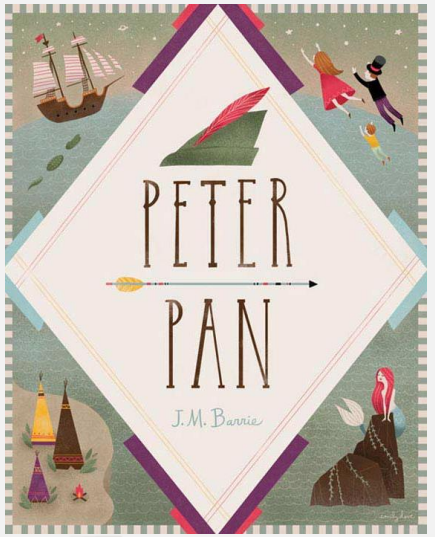
Judging A Book by Its Cover



BASE PAPER

- **Title:** Judging A Book By Its Cover
- **Published At:** Computing Research Repository(CoRR)
- **Publication Date:** 13 Oct 2017
- **Citation:** 29
- **Link:** https://arxiv.org/pdf/1610.09204v3.pdf
- **Ranked #1** on Genre Classification on Book Cover dataset

CODE

Two different group has worked on this paper:

a. https://github.com/akshaybhatia10/Book-Genre-Classification

b. https://github.com/sidsudhakaran/BookCoverClassifier

DATASET

1. Official book dataset that was made by the researchers just for this paper :

https://github.com/uchidalab/book-dataset

2. Imagenet

https://image-net.org/index.php

BASE PAPER KEY IDEAS:

The key ideas of the paper are:

1. Using a deep Convolutional Neural Network (CNN) to predict the genre of a book based on its cover.

2. Demonstrating that connections between book genres can be learned using only cover images.

3. Adapting AlexNet pre-trained on ImageNet for the task of genre recognition.

4. Revealing the relationships automatically learned between genres and book covers.

5. Exploring the design principles that the CNN was able to automatically learn, including text qualities and font properties.

Network Architecture

1. AlexNet

Trained with gradient decent with an initial learning rate of 0.01, after which, the learning rate was divided by 10 every 100,000 iterations. The reported results were taken after 450,000 iterations. Also, a weight decay of 0.0005 and momentum of 0.9 was implemented.

2. LeNet

Each layer used ReLU activations and a constant learning rate of 0.0001. Dropout with a keep probability of 0.5 was used after the fully connected layer. Finally, the network was trained for 30,000 iterations of using an Adam optimizer

LEARNT BOOK COVER DESIGN PRINCIPLE

1.Based on Color

"Self-Help"
White

"Religion & Spirituality"
Yellow

"Science & Math"
Green

"Computers & Technology"
Blue

"Medical Books"
Red

"Biographies & Memoirs"
Black

Fig. 4: Book covers from genres with particular color associations. Each example was correctly classified by the AlexNet.

2. Based on Pallets

"Cookbooks, Food & Wine"
Beige

"Crafts, Hobbies & Home"
Green

"Children's Books"
Bright

"Science Fiction & Fantasy"
Dark

Fig. 5: Book covers that were successfully classified by the common moods or color pallets of respective genres.

BOOK COVER DESIGN PRINCIPLE

3. Based on text and layout

"Law"
Title Boards

"Travel"
Landscape Photographs

Fig. 7: Examples of layout considerations as determined by the AlexNet for "Law" and "Travel.".

"Mystery, Thriller & Suspense"
Large Overlaid Text

"Test Preparation"
Large but Short Text

"Calendars"
Sparse Text

"Literature & Fiction"
Expressive Fonts

Fig. 8: Book covers showing text and font differences.

4. Based on Object

"Parenting & Relationships"
Young

"Sports & Outdoors"
Active

"History"
Soldiers

"Health, Fitness & Dieting"
Exercise or Doctors

Fig. 6: Correctly classified book covers that feature different aspects of humans.

OUR PROPOSAL

1. **Dataset:** We'll build a large dataset of Bengali books by web scrapping to test our model

2. Genre reduction: 30 classes of genres were used here. AlexNet got 24.7% accuracy and LeNet got 13.5% accuracy in the provided architecture. We will try to increase accuracy by reducing genre to more mainstream classes.

3. Multi label Classification: Here single label classification was used. Randomization was done when the book went to multiple class. Multi label classification can decrease misclassification.

4. **Increasing the size of the network** or tuning the hyperparameters may improve the performance.

THANK YOU