



IMAGION

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Purpose

- To predict the success of Instagram images.
- Why Instagram? Very popular social media platform, used by individuals, small and large businesses, combines pictures and text, fast growing, global reach. High impact.
- Images scored on scale of 0-10. Scores are function of likes and performance of similar images in the past.

Target Demographic

- Advertisers
- Influencers
- Everyday users as well (everybody wants more Instagram likes 😊👍)
- Common question: “Which of these two images will get more attention?”

Impact

- Quick, efficient and effective selection of quality pictures
- Gives users a better idea of characteristics and features that make image 'better'
- Advertisers: Reduces advertise spend for companies
- Influencers: Increases popularity

Application Design

- Purpose boldly and clearly stated
- Attractive, intuitive, enjoyable experience for user
- Main feature are easy to find
- Quickly access results once inputs are uploaded
- Output displayed in simple and elegant manner

IMAGION



Home

About

Upload Your Picture

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Upload Your Pictures (5 at most)

bestseller1-aveda.jpg
(46.11 KB)

Product-Aveda-Beautifying_Cr...
(101.61 KB)

2 files selected Remove Upload Browse ...

Analysis Result

IMAGE



SCORE/SUGGESTION

4.8

Suggestion: This image is associated with an average score. Including t in your post may improve the quality: cat, fun, reflection, shoulder, s room, jeans, leg, people

Google Vision API

Top 5 labels for each image score

Score	1	2	3	4	5
0	purple	product	art	text	red
1	room	plant	product	meal	dish
2	landmark	face	black	tree	meal
3	fashion access	purple	waterway	eyebrow	man
4	motor vehicle	room	yellow	blue	white
5	facial hair	mountain	face black & white		plant
6	vacation	mountain	eyewear	swimwear	beauty
7	cat	fun	reflection	shoulder	sea
8	swimwear	room	jeans	leg	people
9	road	t shirt	girl	mammal	plant
10	dessert	rock	girl	mammal	photograph

Model

- Model type: Custom ConvNet with ~17mil parameters
 - Designed for regression output (linear activation on final Dense layer)
 - See *Appendix A* for illustration of model
- Inputs: Sample of ~12k images from Instagram
- Labels: Image score (more info on next slide)
- Trained for 30 hours to ensure good fit using NVIDIA Tesla P100 GPU
- Loss: ~0.02 MSE after about 120 epochs

Image Score

- Based on historical likes for user (over past x posts)
- Number of likes for each image is standardized for each user
- Standardized scores across users are normalized into $[0,10]$ range to give final **Image Score**
- Excellent image = 10. Bad image = 0.



Evaluation

- Scoring accuracy function that ranks two randomly selected pictures from same user.
- Then accuracy calculated based on share of correct comparisons.
- Baseline is pro-Instagram user's ranking.

```
beverlyjoubert_10
beverlyjoubert_14
0
0
equal
a
False

1694 comparisons made
Accuracy score is: 0.27
```

Demo

www.ucbimagion.com

Results

- Model performance: 50.24% on our test data set (~1459 comparisons made)
- Expert performance: 67.5% on test data (40 comparisons)
- Average person performance: 47.5% on test data (40 comparisons)

Recap

- Successfully built out end-to-end pipeline for evaluating user-uploaded images
- Made several improvements to model but still not satisfactory enough

Challenges

- Model adjustment is time-consuming and somewhat mysterious (several iterations of model)
 - Parameters, pre-training Y/N, activation functions, optimizers, normalization, etc. needed to be tuned with every iteration
- Likes are not only a reflection of how good the image was (many other factors involved)
- Developing a quality score that reflects success of image for particular user, but that is consistent across users.

Future Work

- Gain access to a larger sample of images (perhaps IG API)
- Concatenate more relevant variables to image input
- Model image scores separately based on different use cases – advertising, models, sports, singers, actors
- Get tangible results to evaluate model
 - i.e. using two accounts – one with lower ranked images and another with higher ranked images (high-rank account should get more likes)

Thank You!

– The Imagion Team

Appendix A - Model Architecture

Layer (type)	Output Shape	Param #
conv2d_1 (Conv2D)	(None, 100, 100, 32)	896
activation_1 (Activation)	(None, 100, 100, 32)	0
conv2d_2 (Conv2D)	(None, 98, 98, 32)	9248
activation_2 (Activation)	(None, 98, 98, 32)	0
max_pooling2d_1 (MaxPooling2D)	(None, 49, 49, 32)	0
dropout_1 (Dropout)	(None, 49, 49, 32)	0
conv2d_3 (Conv2D)	(None, 49, 49, 64)	18496
activation_3 (Activation)	(None, 49, 49, 64)	0
conv2d_4 (Conv2D)	(None, 47, 47, 64)	36928
activation_4 (Activation)	(None, 47, 47, 64)	0
max_pooling2d_2 (MaxPooling2D)	(None, 23, 23, 64)	0
dropout_2 (Dropout)	(None, 23, 23, 64)	0
flatten_1 (Flatten)	(None, 33856)	0
dense_1 (Dense)	(None, 512)	17334784
activation_5 (Activation)	(None, 512)	0
dropout_3 (Dropout)	(None, 512)	0
dense_2 (Dense)	(None, 1)	513
activation_6 (Activation)	(None, 1)	0
Total params: 17,400,865		
Trainable params: 17,400,865		
Non-trainable params: 0		