

# # ImageClassificationBot

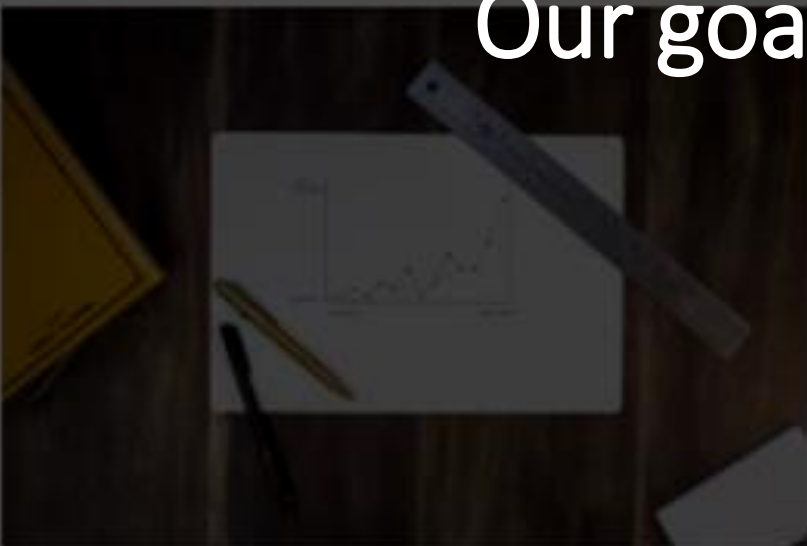
#hashtag

A yellow and blue robot with large binocular-like eyes, standing on a reflective surface. The robot has a yellow body with blue accents and large, black, treaded wheels. It is positioned on the right side of the frame, with its reflection visible on the dark, glossy floor. The background is dark and out of focus.

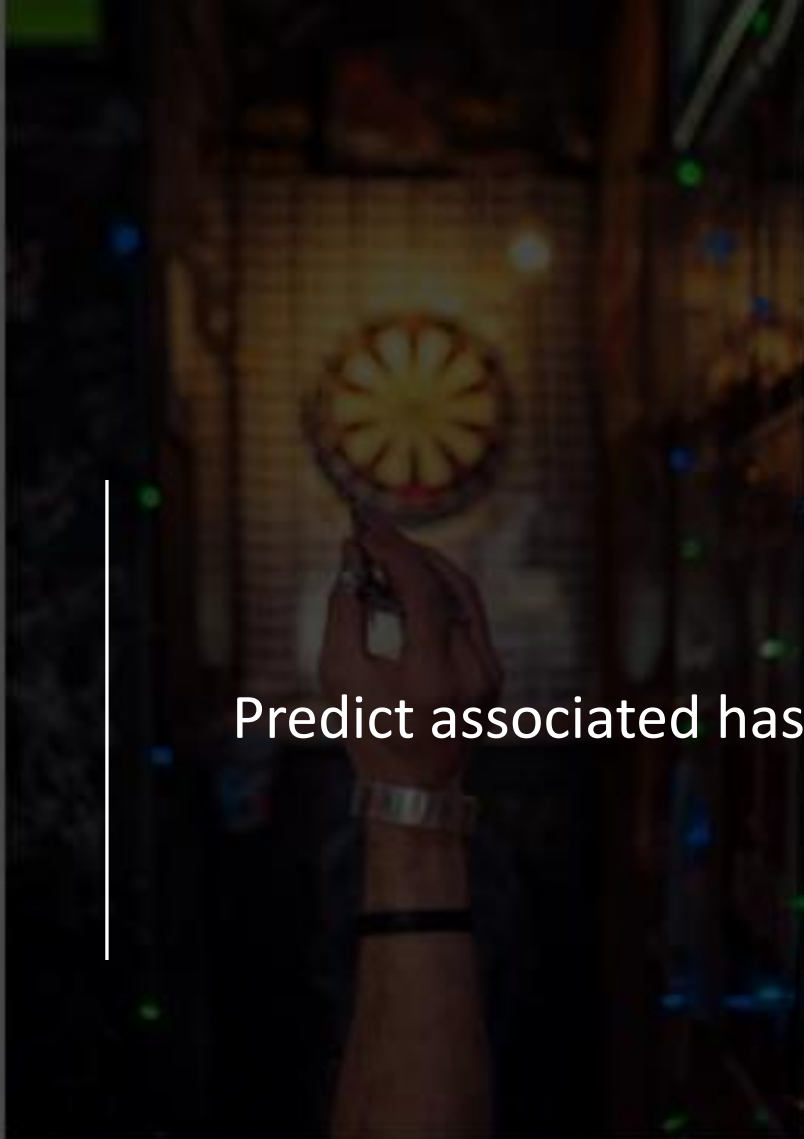


Electronics HD Computer Wallpapers

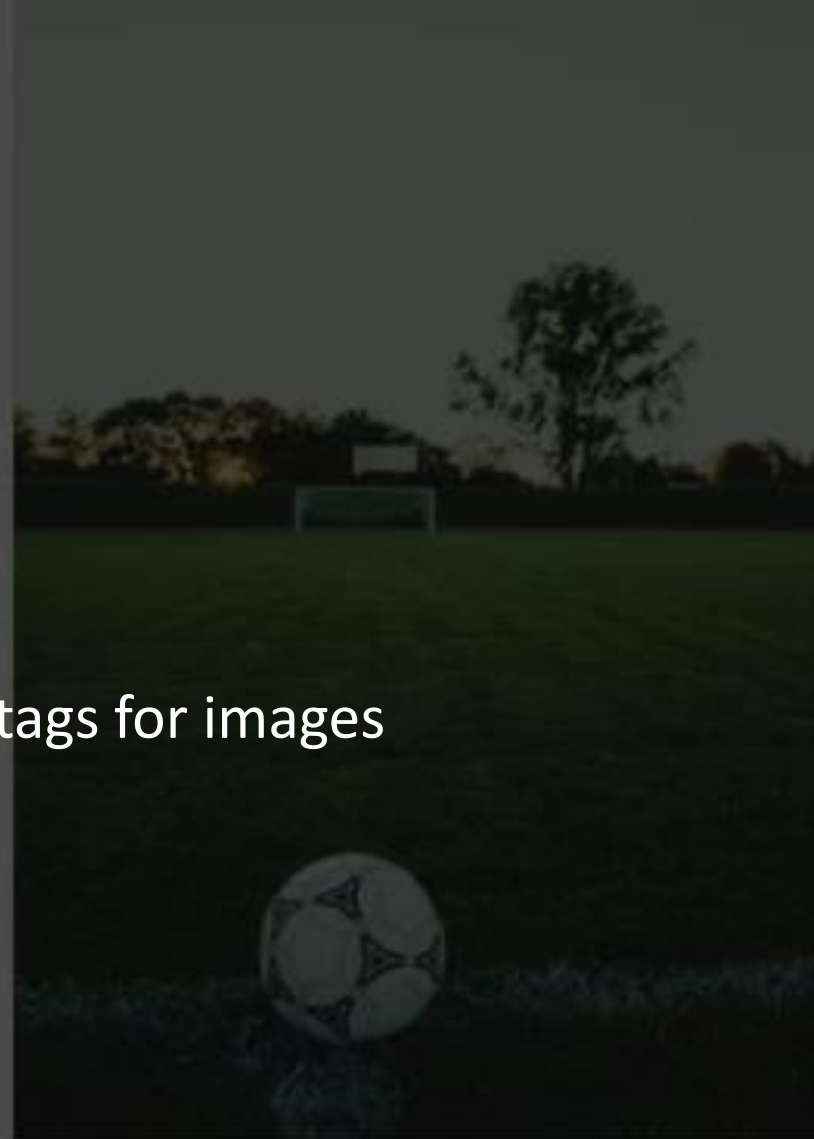
Computer Hardware



Pen Graph Selling



Darts Finger Game



Sports Images Best Soccer Pictures Football Images

Our goal

Predict associated hashtags for images

# Unsplash

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Full dataset - 2M+ high resolution images

Lite dataset - 25k nature-themed photos

Our dataset - 13k links for high resolution images



<https://unsplash.com>





### Challenges:

- Label quality inconsistent
- Download image data without saving to disk each image
- Varying sizes and color format

### Solutions:

- Extract only 10 most common keywords with a confidence interval of 99%
- Use urllib and NumPy to extract the pixel array for each image
- Adjust all images to 224\*224 size and RGB format

# Unsplash

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Human People Images & Pictures Blue Ash

Apparel Clothing Footwear



Apparel Clothing Sunglasses



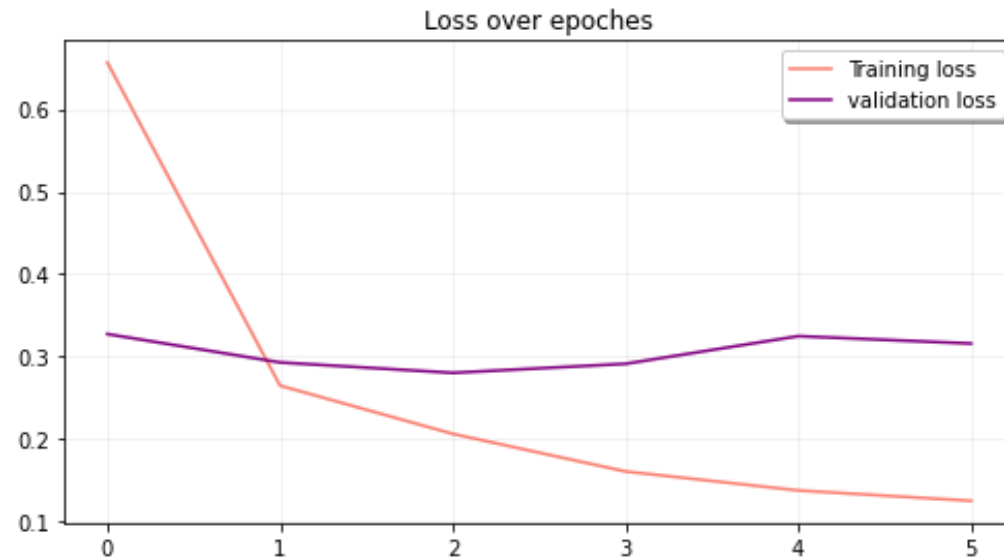
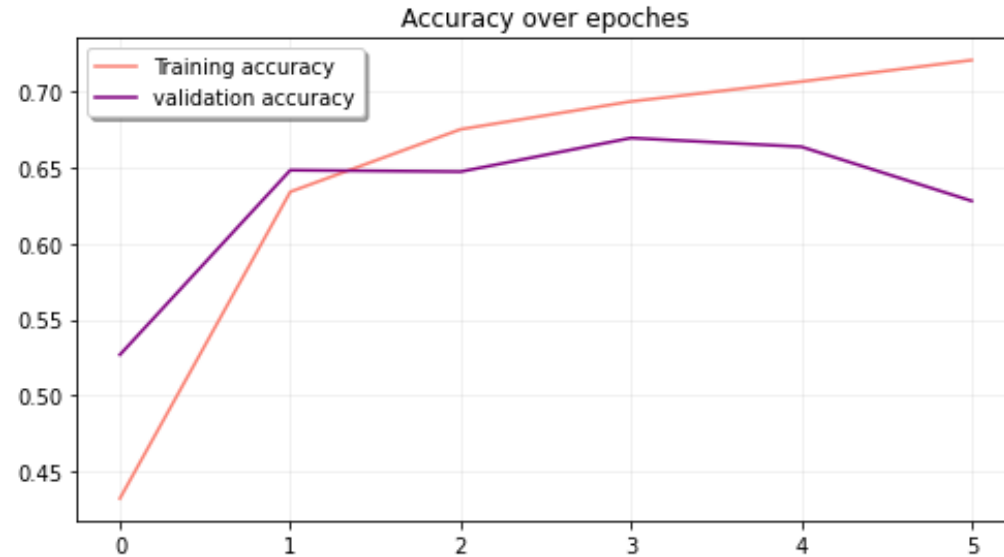
Apparel Clothing Footwear



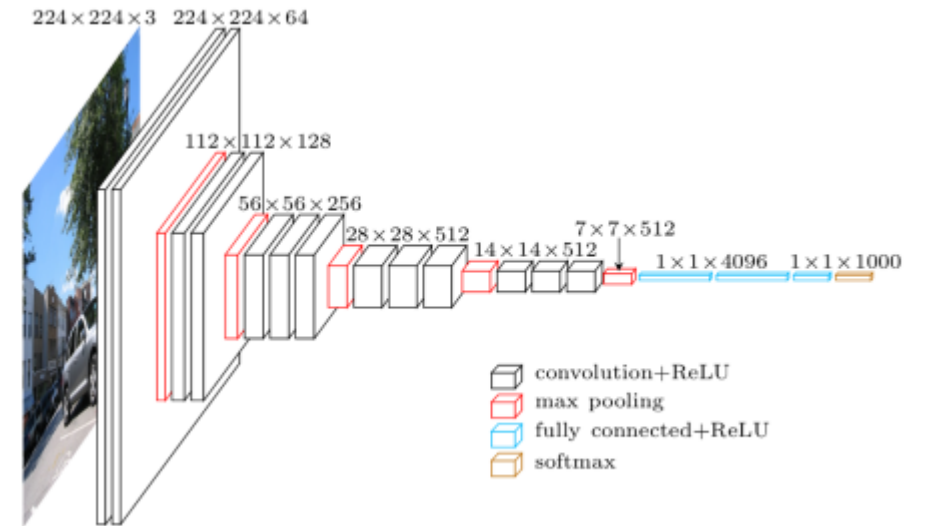


# VGG16

- A super-deep neural network
- 16 weight layers
- Obtains good results
- But at what price? - Slow & heavy to train



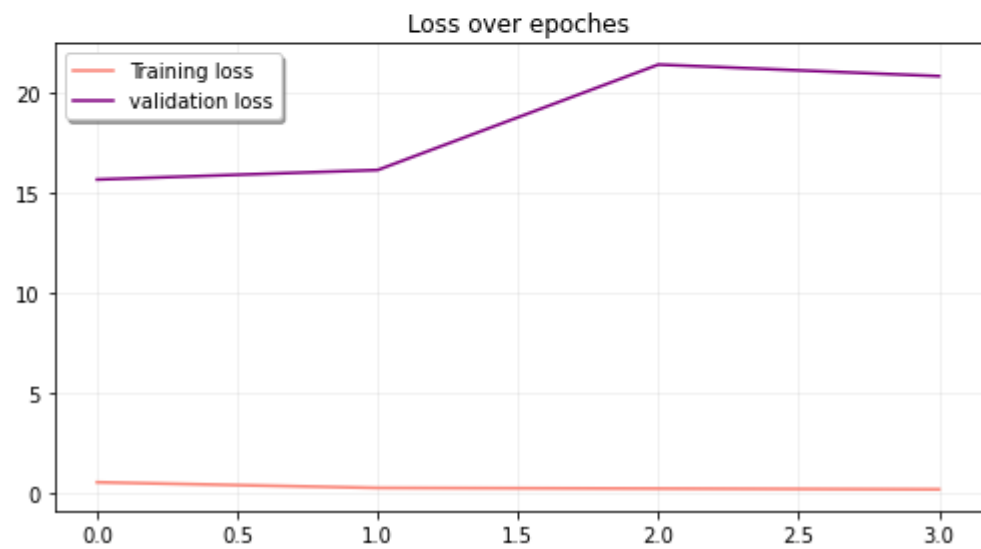
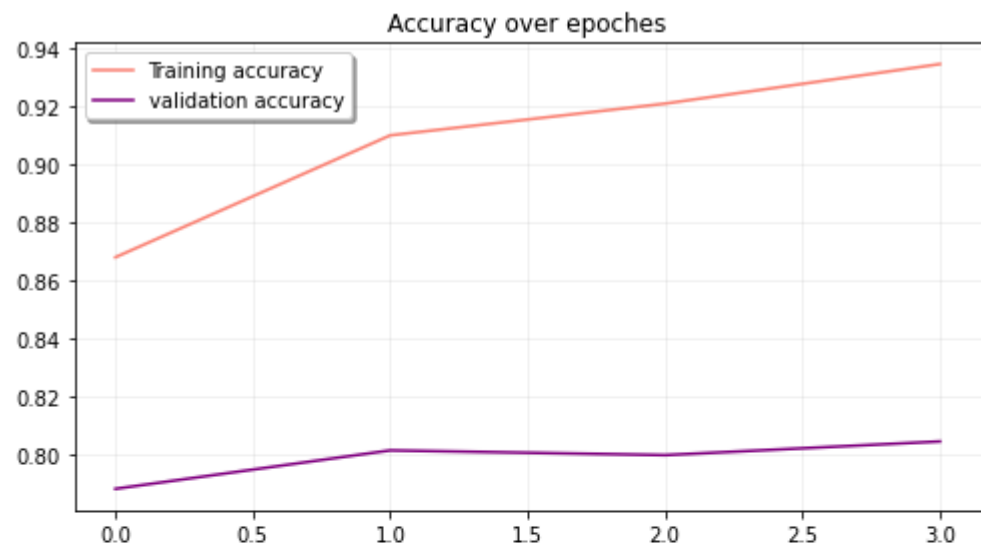
# VGG16



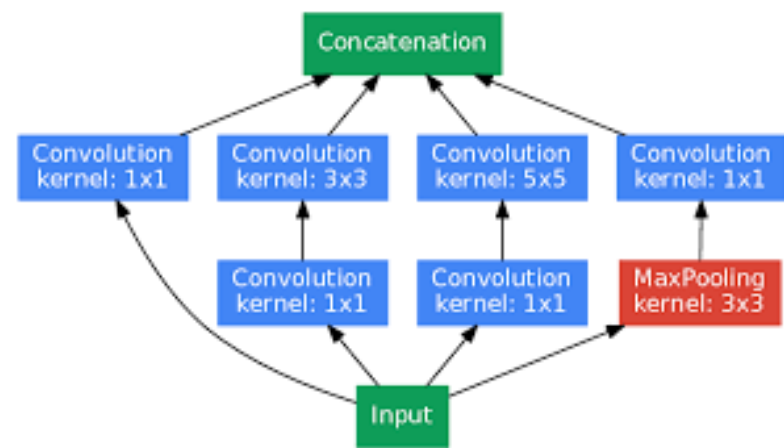
# Inception V3

- Multiple modules of convolutions
- Weighs about 75% less than VGG16
- What about accuracy?



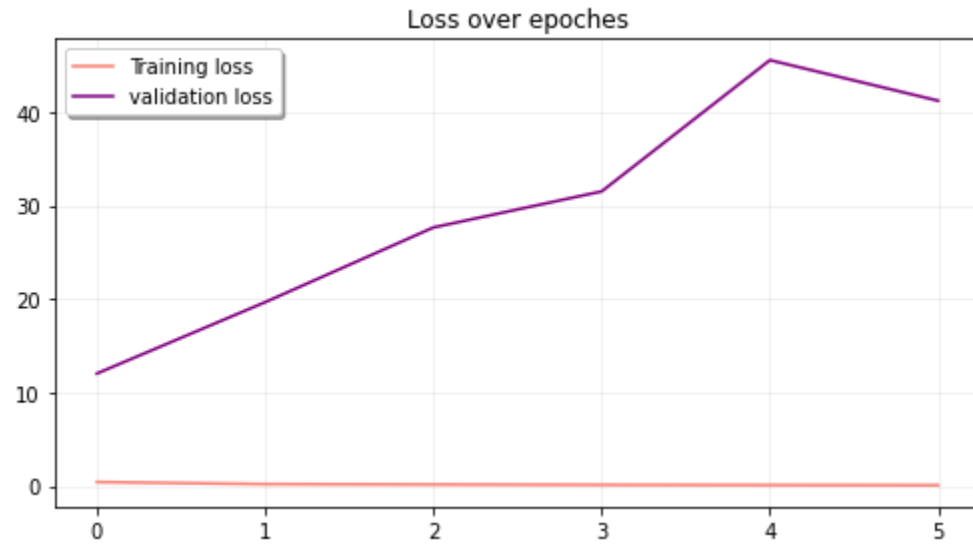
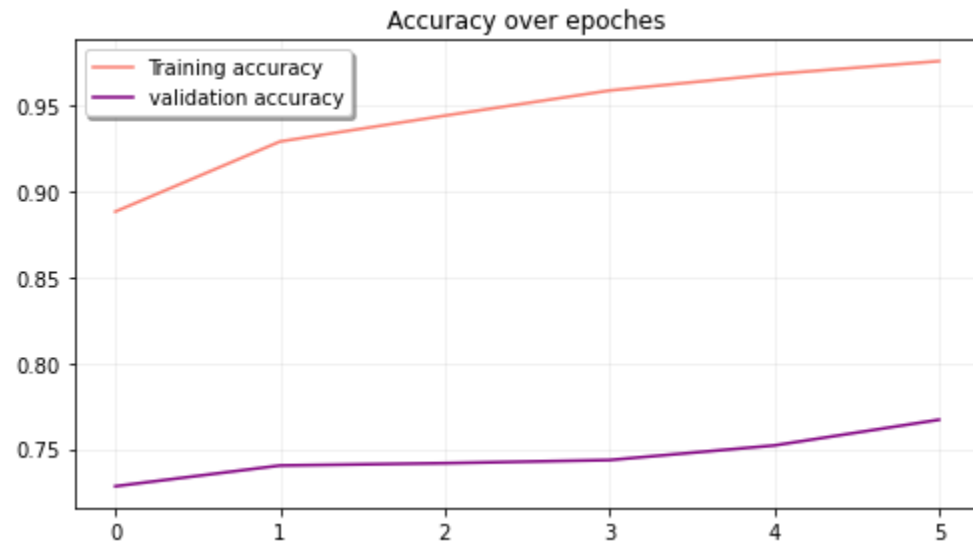


# Inception V3

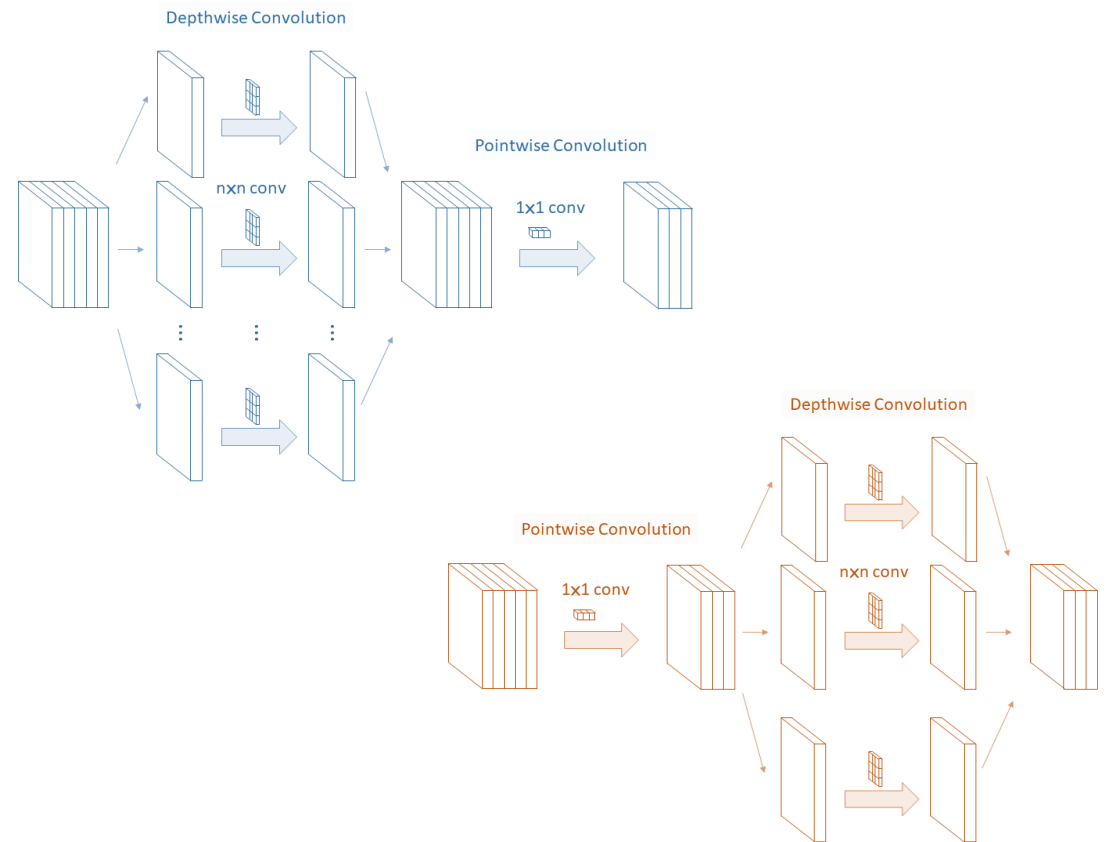


# Xception

- Builds on the Inception architecture
- perform  $1 \times 1$  convolution first then channel-wise spatial convolution.
- Weighs about 90 MB!

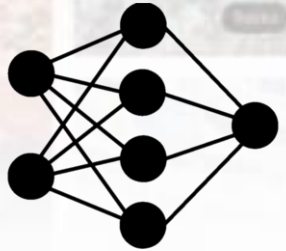


# Xception





# Results



## MODEL

## ACCURACY

## SIZE - parameters

## LOSS - binary\_crossentropy

VGG16

68%

Trainable : ~ 3.2M

Non-trainable : ~ 14.7M

~ 0.3

InceptionV3

80%

Trainable : ~ 6.5M

Non-trainable : ~ 21.8M

~ 20

Xception

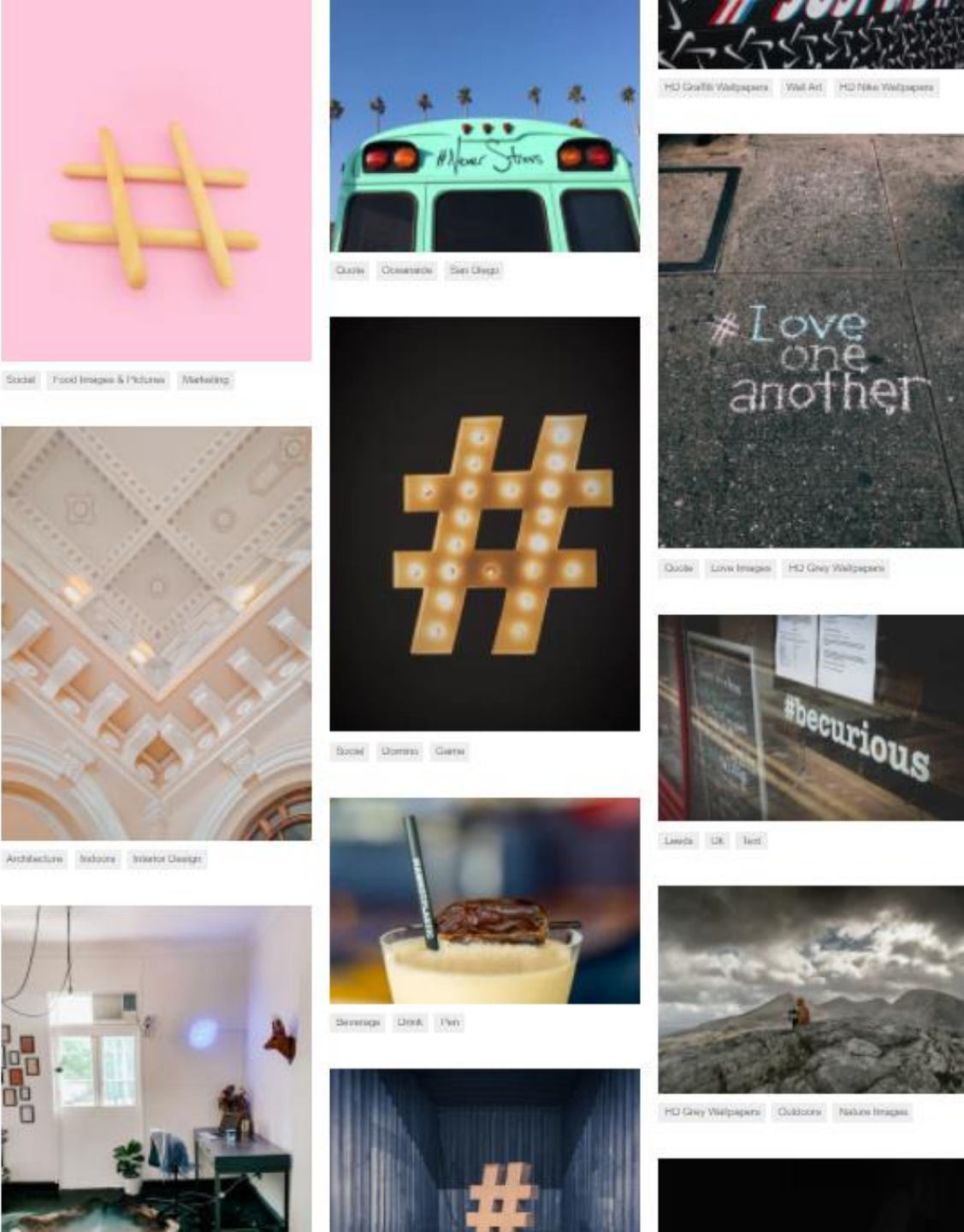
76%

Trainable : ~ 12.8M

Non-trainable : ~ 20.8M

~ 41

- Source: <https://comparecamp.com/hashtags-statistics>



The background of the slide is a collage of several images related to smartphones and social media. It includes a person holding a phone, a close-up of a phone screen, a hand holding a phone, and a phone screen displaying a social media interface. The images are slightly faded and overlaid with a dark grey semi-transparent layer.

# Top Hashtag

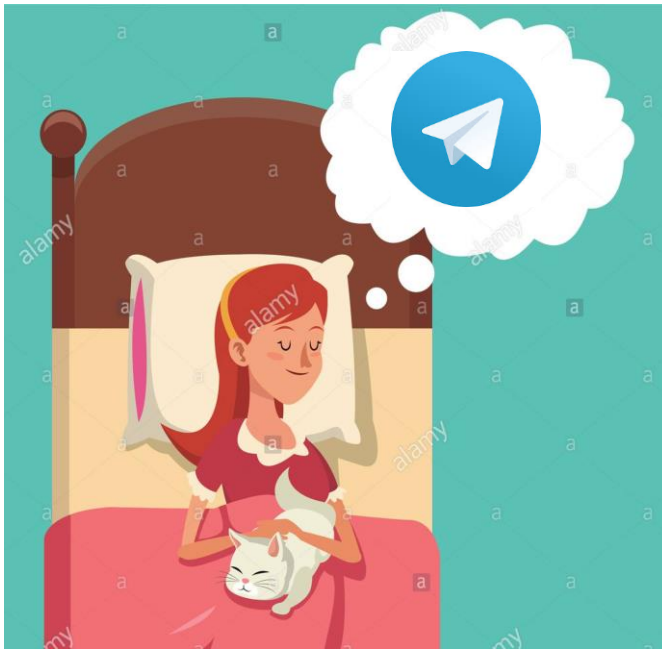
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- The average hashtags tweeted daily is... **125 million**
- The most-tweeted TV hashtag is... **#TheWalkingDead**
- The most-tweeted movie hashtag is... **#StarWars**
- The most tweeted about sports league is... **#NFL**
- The hashtag #NowPlaying (or #np) has been tweeted more than... **1 billion times**



# The Bot

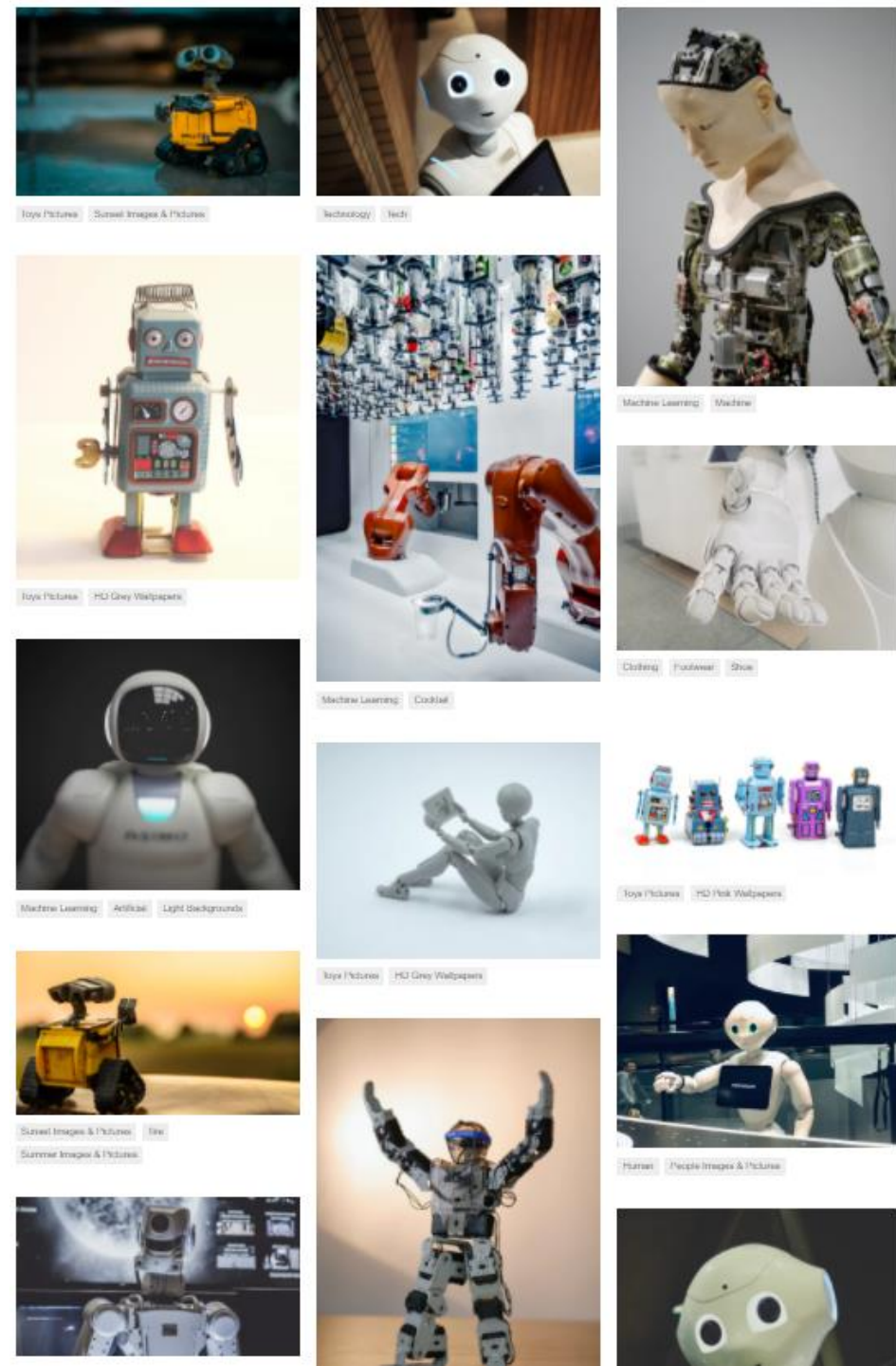
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Live Demo:

[https://t.me/Pic\\_hashtag\\_bot](https://t.me/Pic_hashtag_bot)

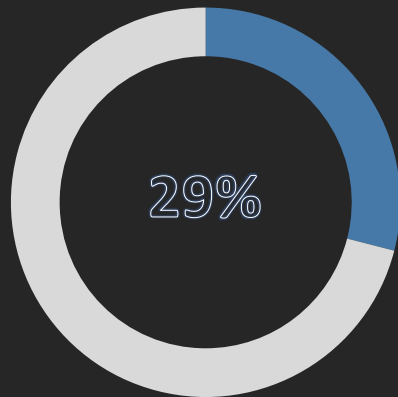
Try it by yourself, the link will be in the chat 😊



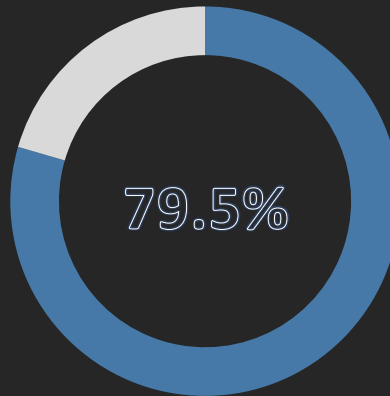
# Next Steps

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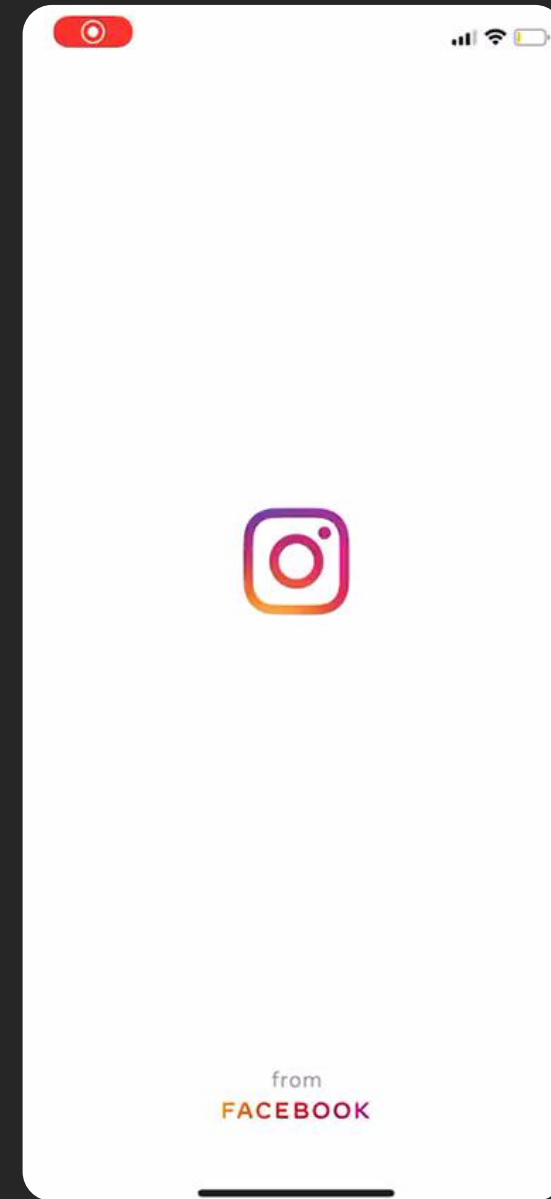
- Web scraping from Instagram



More interactions for posts  
with at least 1 hashtag



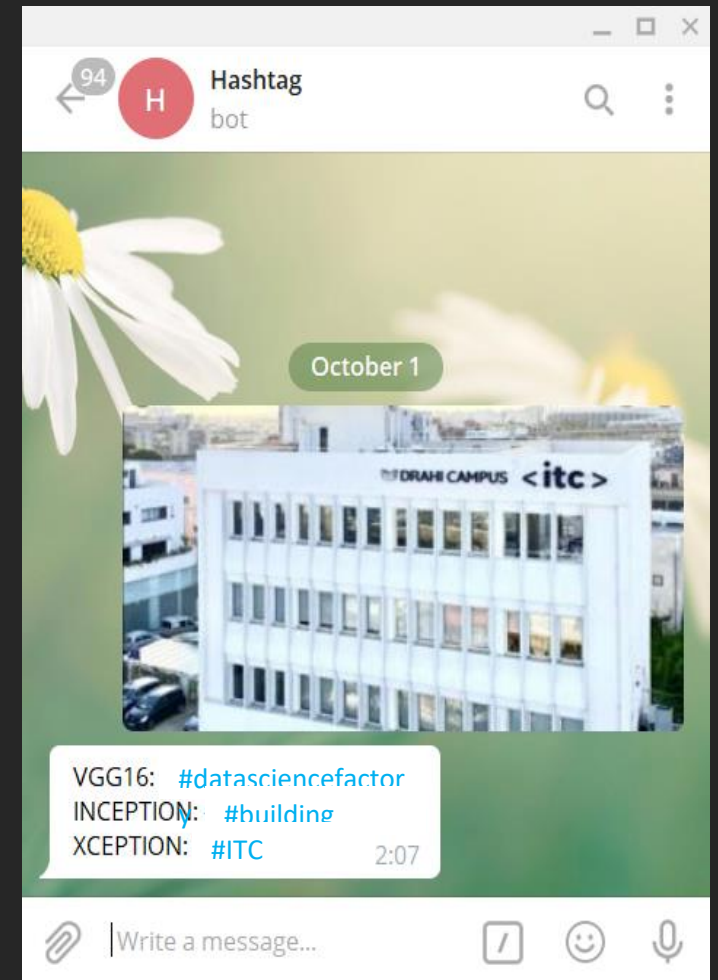
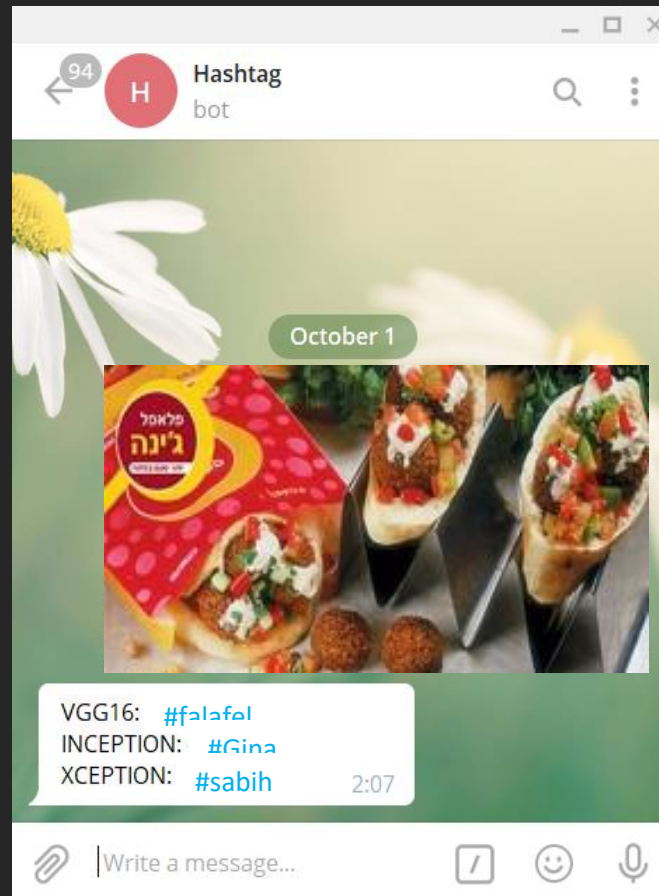
More interactions for  
posts with 11 hashtag



# Next Steps

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Add more keywords  
and train on larger  
datasets







Words Gratitude



Dog Images & Pictures Appreciation

Animals Images & Pictures



HD Wood Wallpapers Hardwood HD Grey Wallpapers



HD Black Wallpapers Hand Melbourne



Words Frame Thanksgiving Images

