

TECHNICAL LAYOUT

Phase I

Taxonomy



Creating Image Library



Creating Dataset for training
Image Recognition Model

Phase II

Processing, Reshaping and
Standardizing dataset



Training of Dataset

- Most Crucial stage

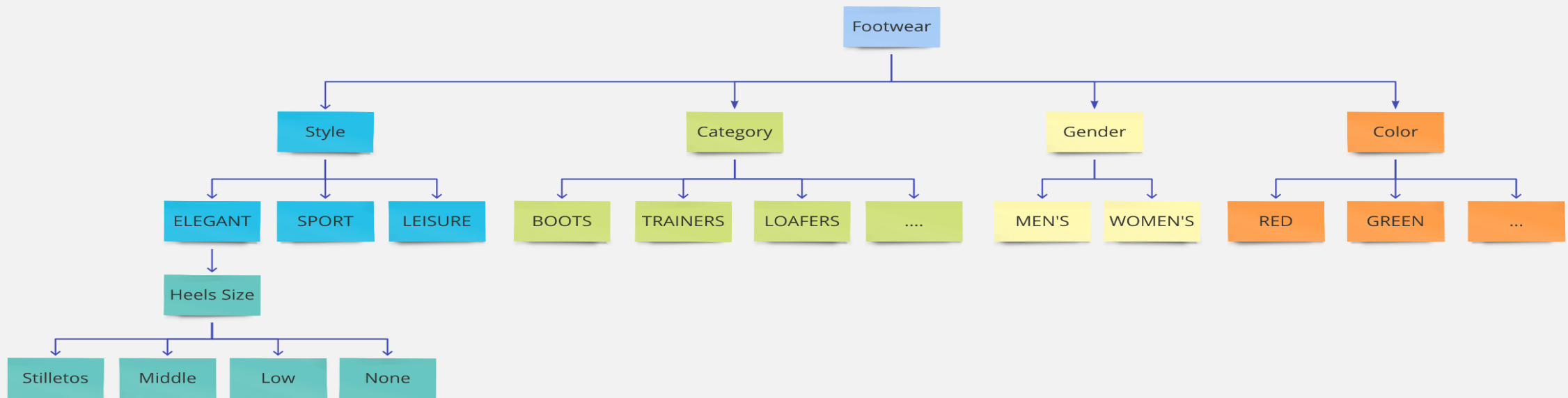


Deploy

Taxonomy

PHASE I

- Firstly we should know taxonomy of image recognition system
- In other words what kind of labels we would like to recognize
- For example, consider shoes , there are sneakers which are for leisure time and there are sneakers for running. The entire Footwear taxonomy can be complex as we could recognize the **style, color, brand, pattern, heel size**
- There will be category and sub-category for classification



PHASE I

Creating Image library

- Collection of images from Web
- Tool used will be **Bing Search Api**
- We can also **Scrapy** Library
- For each label there should be 50-100 images at least, if results are not satisfactory we need to further collect more images

Creating Dataset

- Now we need to create dataset for collected data
- If we have used **Bing Search Api** it will automatically create Dataset of image and its labels
- If we have used **scrapy** we have collected images, now we need to create dataset (h5 file), it can be done by **h5py** library

PHASE II

Processing,
Reshaping
and
Standardizing

- We need to put our data in a format on which we can train our model
- It will be done by Pandas and Numpy library

Training of Dataset

PHASE II

- The task of effective image tagging typically consists of two stages, which involve initial image tagging and subsequent tag refinement
- We will create a software that will take images as user inputs and tag them based on the features of the image using Auto-Tagging Feature .First we will create a training set of data and train our software to tag it based on auto-tagging algorithms and then the software will automatically tag the images based on the features included in image

Training of Dataset

PHASE II

- Image Classification which will classify the images uploaded by the user based on the features or what the image is about
- Classifier algorithms which are based on Neural Networks And the Clustering algorithms to classify the images based on pixels and shapes and sizes and also we will classify them on basis of texture, geometry and context.

Training of Dataset

PHASE II

- We can use Cloud services to reduce the requirement of high processing power on the normal computer infrastructure.
- We will use **SIFT** for Image Annotation for directly annotation of tags and **Tag Prop** algorithm for same purpose of automatically tagging image based on their characteristics.
- We will execute operations on Jupyter Notebook. Jupyter Notebook is an open-source web application which allows us to create documents. Jupyter helps to provide a environment that allows us to see the code, execute the code without interrupting and leaving the environment

Training of Dataset

PHASE II

- We will use Keras for implementing algorithm.
- Keras is a high-level neural networks API, written in Python and capable of running on top of TensorFlow.
- The TagProp algorithm learns rank- or distance-based weights of nearest neighbor images as part of a joint probability model for the occurrence of tags associated with images. We will be using this algorithm for tagging.

Training of Dataset


PHASE II

- Architecture of Network used will be AlexNet
- AlexNet is the name of a convolutional neural network, designed by Alex Krizhevsky. It contains 5 convolutional layers and 3 fully connected layers.
- Relu is applied after every convolutional and fully connected layer

PHASE II

Deploy

- We can use above model in our application
- Rough working model after deployment will be as shown



TOP CATEGORY

Footwear ▼

CATEGORY

Hiking ▼

RELOAD RESULTS

FEATURES

Color — black	62.59%
Gender — men	57.95%
Heels — low heels	99.41%
Height — low boots	99.50%
Material — leather/faux leather shoes	73.84%
Style — sport	62.95%

ANSWER TO FEW QUESTIONS WITH CONTEXT OF TECHNICAL LAYOUT

Q1. Software used for each part =>

1. Whole code will be executed on **Jupyter Notebook**
2. **Bing Search API** or **Scrapy** library will be used for Collecting Images
3. Dataset will be created by **h5py** library
4. Processing, Reshaping and standardization of data will be done by **Pandas and Numpy** Library
5. **TagProp** algorithm will be implemented using **Keras** library built on top of **Tensorflow**.
6. **AlexNet** architecture will be used for **Convolutional Neural Network**

Q2. Approximate Time taken =>

Ans. Time for completion of each task is as follows

1. Taxonomy : 2 days
2. Collection : 2-3 days
3. Creating dataset : 2-3 days
4. Processing, Reshaping and Standardization : 1 day

ANSWER TO FEW QUESTIONS WITH CONTEXT OF TECHNICAL LAYOUT

5. Training The model : Min 1 week

Q3. Requirements =>

Ans. If pre tagged data will be provided it will be excellent will save a lot of time and database will be needed to store data of about 10,000 to 50,000 images

Q4. Building of datasets =>

1. If we use Bing Search Api it will automatically create dataset but it is not effective
2. Preferred method is to use Scrapy library to download image and then building dataset by h5py library

Q5. Parts which require continuous maintenance =>

1. Any user related data should be maintained continuously because it is stored dynamically
2. Feature engineering should be done after continuous interval because few data can become irrelevant after time.

THANK YOU

With Regards

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