

GOOGLE AI OPEN IMAGES CLASSIFICATION

DATS 6203 – Machine Learning II

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Group 8

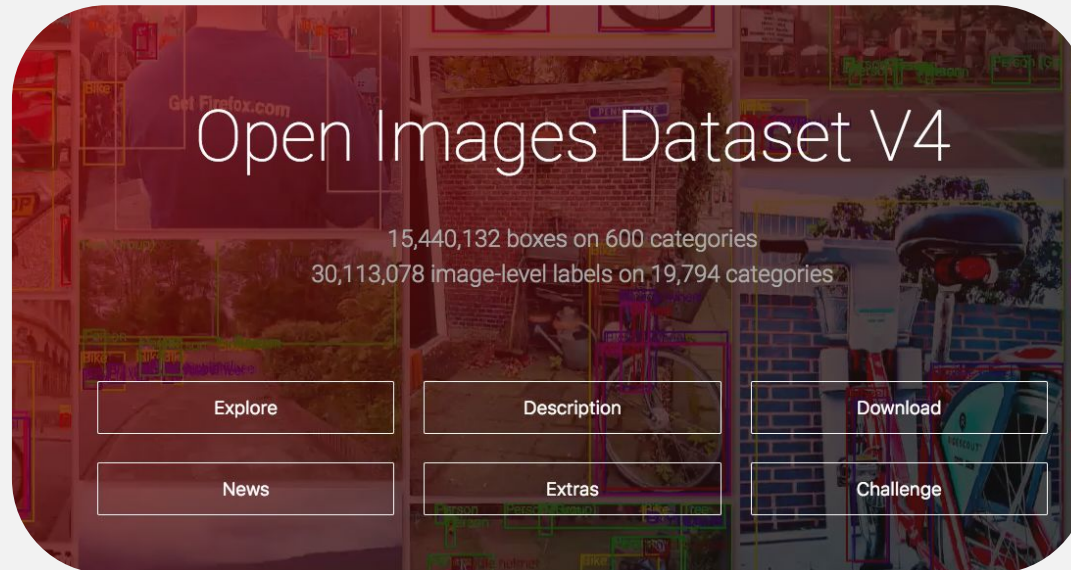
Priyanka, Richa, Hninn

OUTLINE

- Background
- Data Augmentation
- Convolutional Neural Network
- Activation Function
- Results
- Conclusions

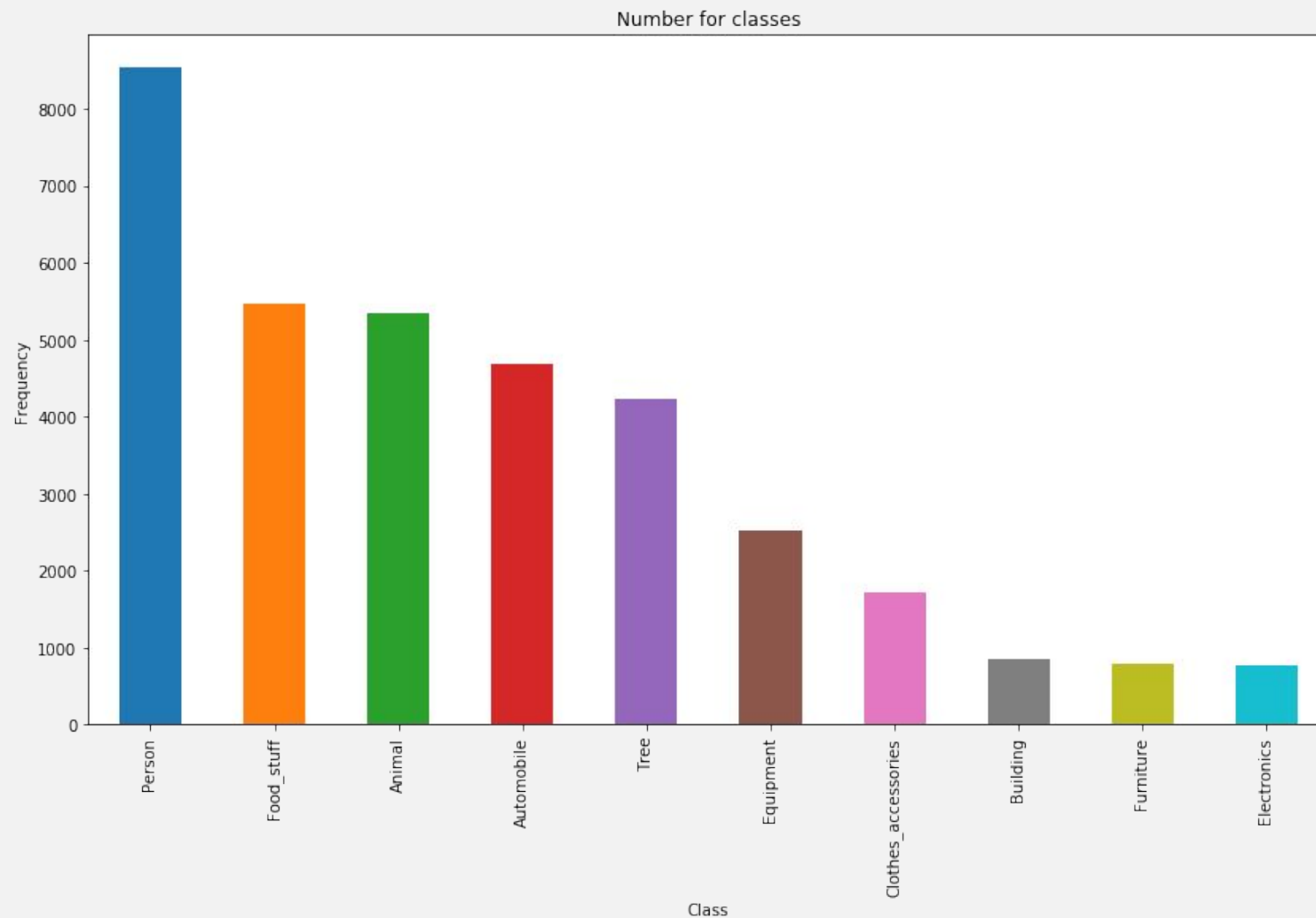
DATA DESCRIPTION

- Google AI Open images dataset - open image dataset V4
- Dataset is built for the purpose of object detection and segmentation
- Consists of natural images – images that reflect everyday scene
- 10 classes with total 35,000 images- includes wide range of images - - 12 GB
- Images are:
 - High resolution (1024x760)
 - Various sizes and shapes
 - Channel – grayscale and RGB



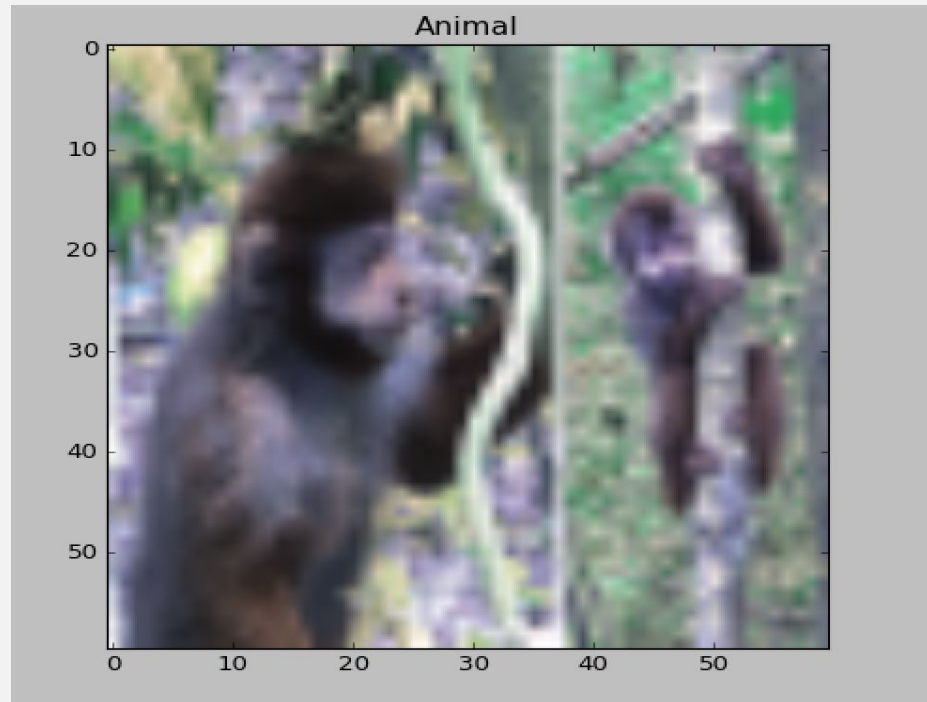
ISSUES WITH DATASET

- Many images with no class name
- Missing imageID in labels data
- Mixture of grey and color images
- Images are not in same shape

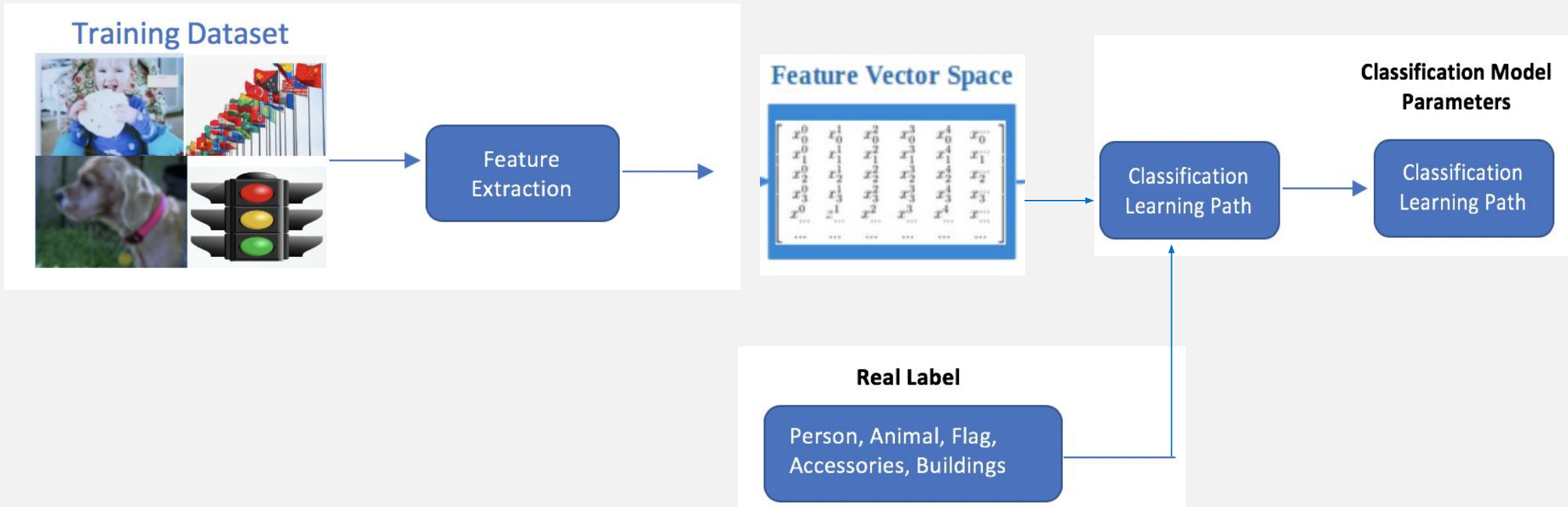


DATA AUGMENTATION

- Resize the images into 60 X 60
- Considered only color images
- Remove grey scale images



ARCHITECTURE FOR LEARNING TASK



CONVOLUTIONAL NEURAL NETWORK

- One or more convolutional layer
- Has many built-in functions
- Resulting in easy to train networks with many fewer parameters



Results

Number of Layers	layers	Frameworks	Time taken	Train Accuracy	Test Accuracy
2	2 Convolutional layers with Max. pooling	Tensorflow	200 min	95%	35%
3	3 Convolutional layers with Max. pooling	Tensorflow	230 min	98.4%	35%
5	3 Convolutional layers with dropout and batch normalization, 2 fully connected layers	Keras	35 min	52%	45%
5	3 Convolutional layers with dropout and batch normalization, 2 fully connected layers with 5 folds	Keras	40 min	53%	47%

LIMITATION

- Can be done better by adding more training data - Memory use
- Classes are equally not distributed

High - Person/food_stuff ← 8,000 images

Low - Building, Furniture ← less 1,000 images



CONCLUSION

- With batch normalization, we got better results
- Accuracy from our small dataset is low
- Challenge faced in this project is the size of the data
- Data augmentation: rotating images and adding more training dataset



REFERENCES

<https://storage.googleapis.com/openimages/web/index.html>

<http://www.kaggle.com/c/dogs-vs-cat>

<https://github.com/amir-jafari>