GOOGLE AI
OPEN IMAGES CLASSIFICATION

DATS 6203 – Machine Learning II

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Group 8

OUTLINE

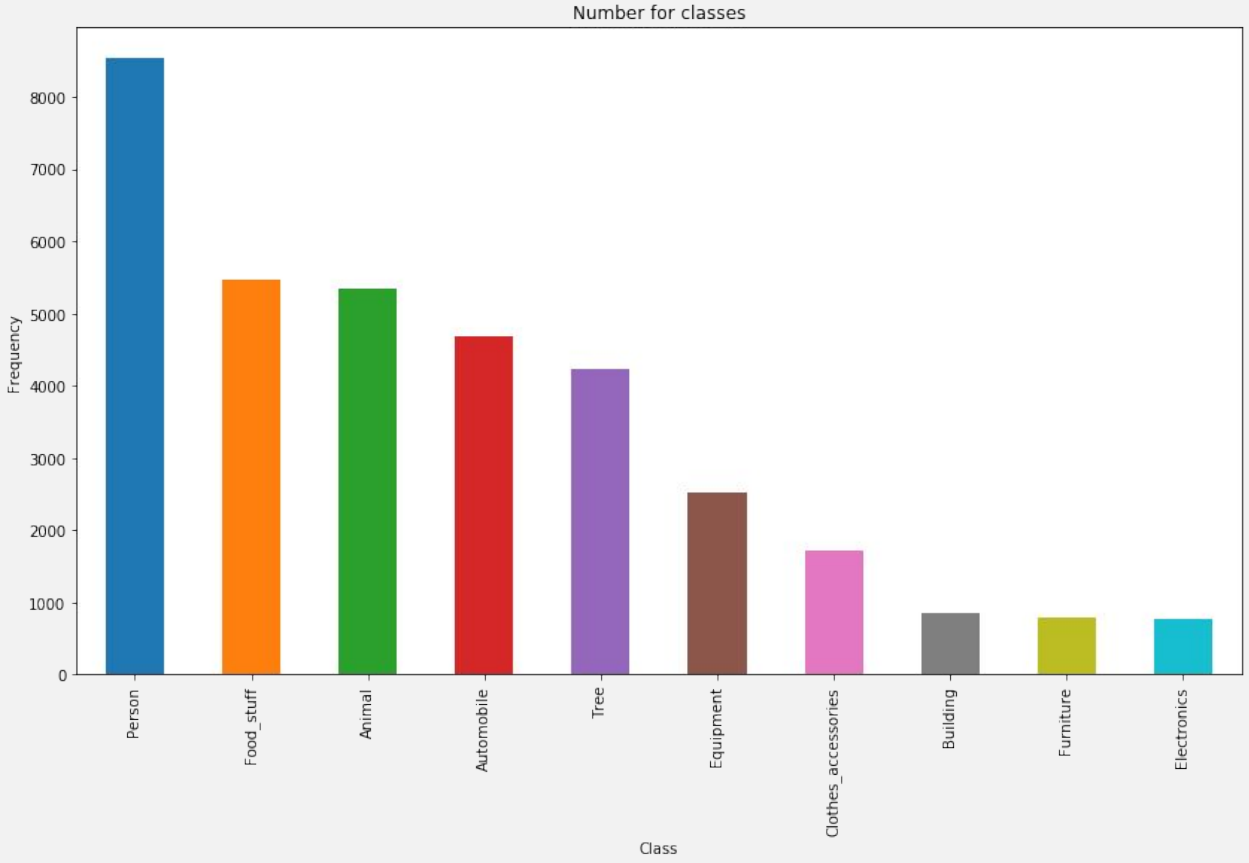
- Background
- Data Augmentation
- Convolutional Neural Network
- Activation Function
- Results
- Conclusions

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

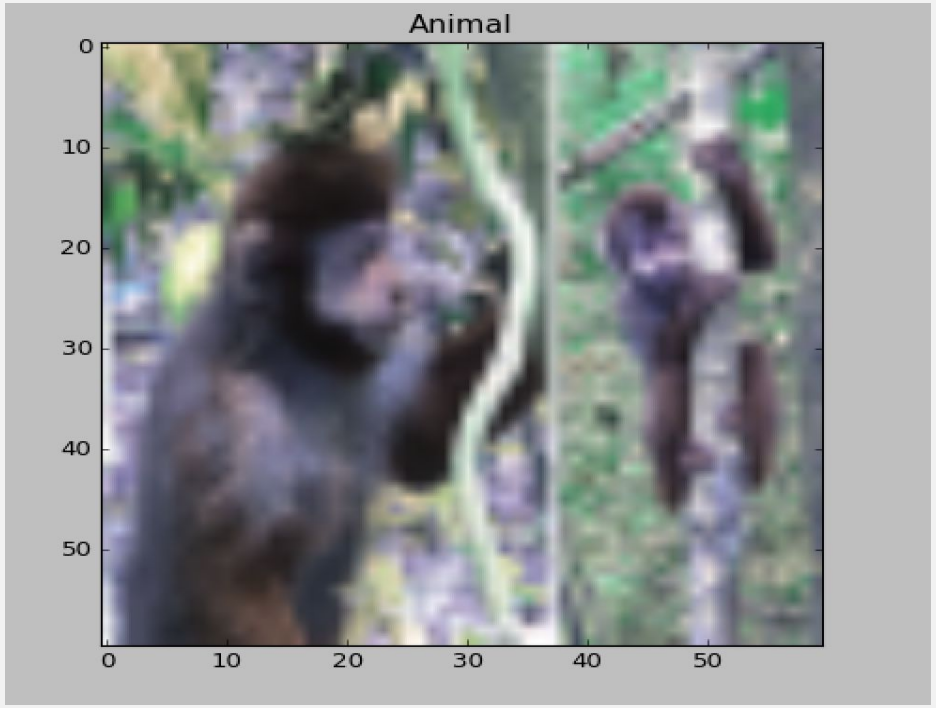
ISSUES WITH DATASET

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



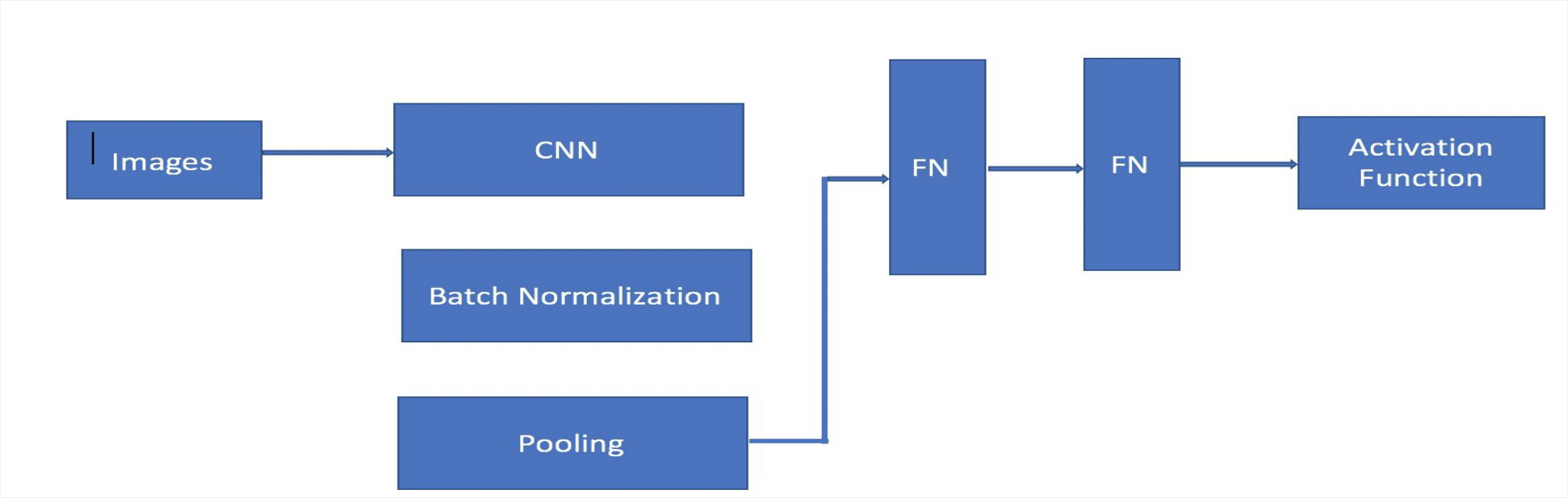
DATA AUGMENTATION

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

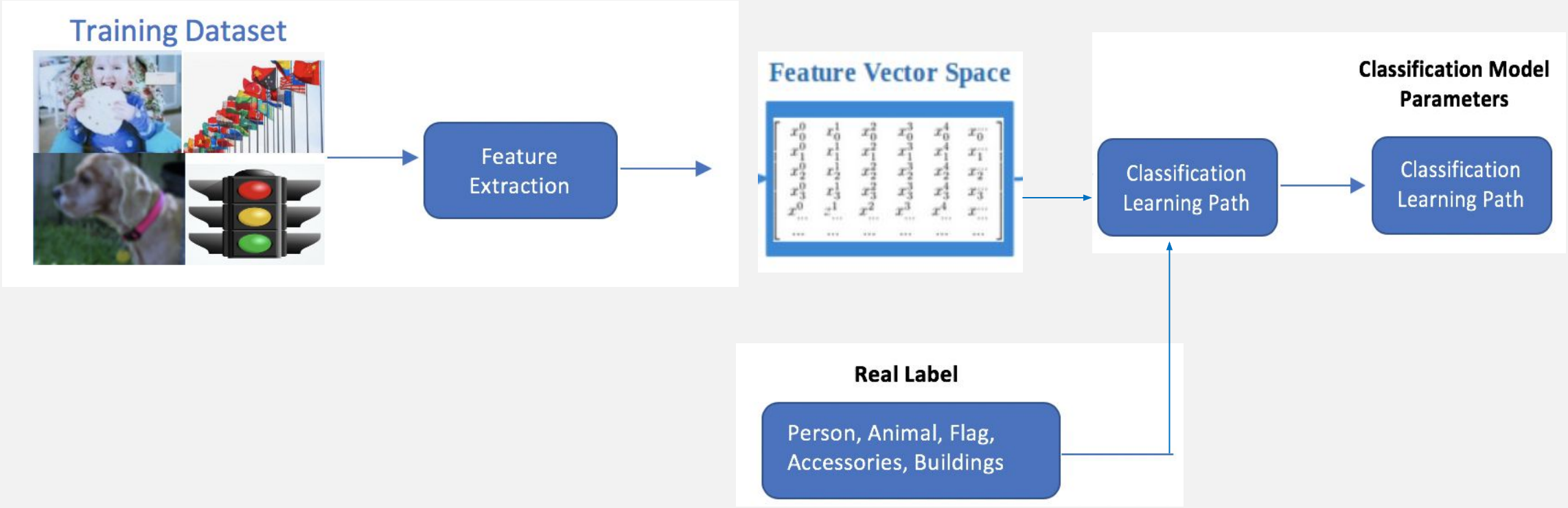


CONVOLUTIONAL NEURAL NETWORK

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



ARCHITECTURE FOR LEARNING TASK

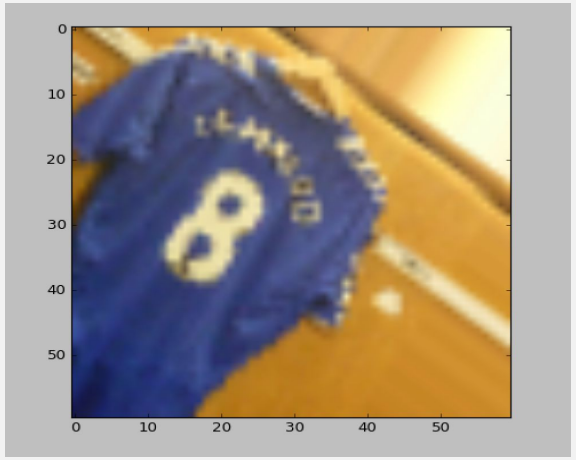


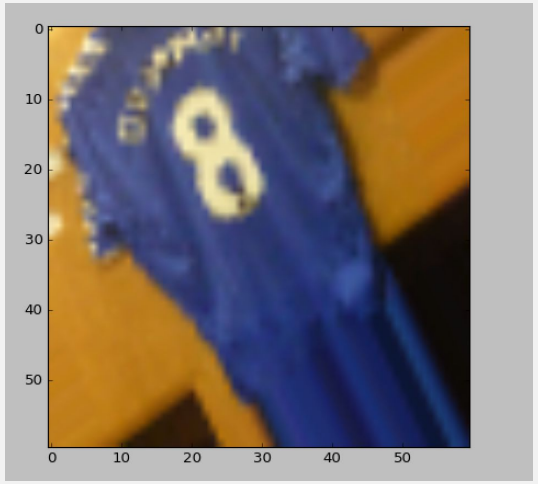
RESULTS

Frameworks		Accuracy	Layers	Kernel size	Epochs
Tensorflow	No Batch Normalization	35%	4	5x5	200
Keras	No Batch Normalization	40%	4	5x5	20
Keras	With Batch Normalization	45%	6	5x5	20
Keras	K-fold cross validation	50%	6	5x5	20

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





LIMITATION

- Can be done better by adding more training data -Memory use
- Trying with different parameters - kernel size, epochs, optimizers might give us better performance
- Classes are equally not distributed
  High - Person/food-stuff
  Low - Building, Furniture

REFERENCES

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

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

https://github.com/amir-jafari