

Convolutional Neural Networks for Different Locations Classification



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Introduction

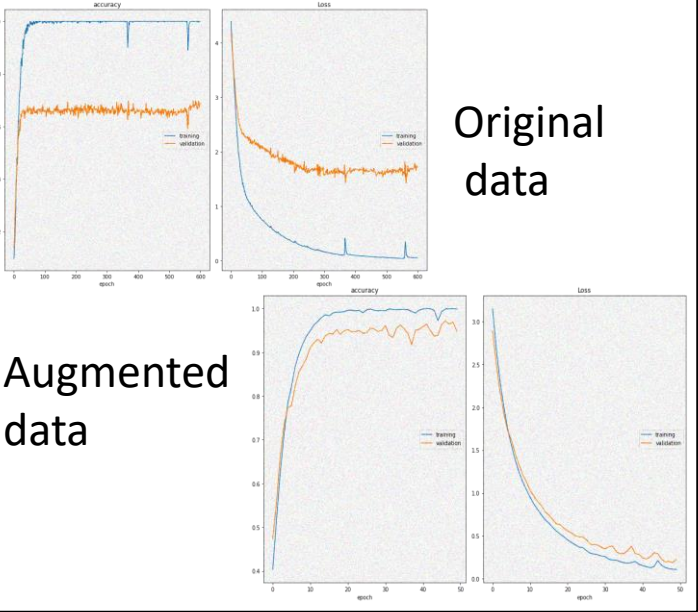
● Image classification, localization, image segmentation, and object detection are examples of major problems in computer vision. Among these, image classification is the most fundamental problem. It forms the basis for other computer vision problems. In this project, we assessed a model for recognizing country name by providing an image of a famous places in it, attempting multiple models, comparing between them, and seeking for the champion model.

Problem Statement

● Building a model that can classify data at different locations from different countries is extremely difficult, especially when using low quality photos that may be insufficiently informative to create a robust general model with high accuracy.

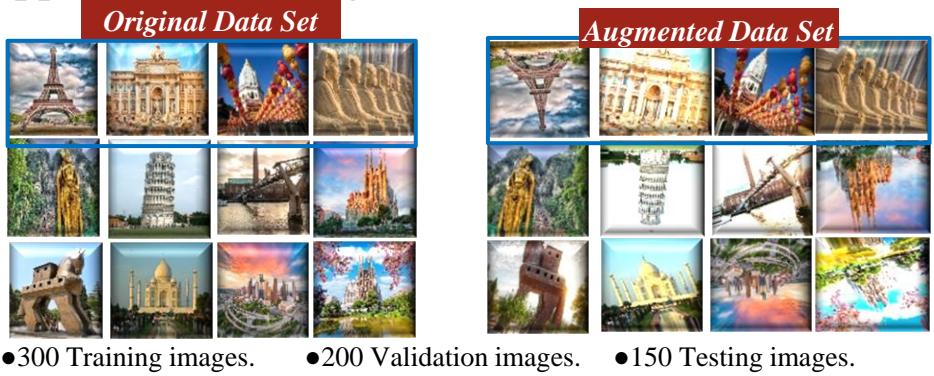
Evaluations

● We use the F2 score to evaluate our model



Dataset

● We collected countries data from Google in a variety of sizes, with 10 classes totaling 650, 65 image per class to train, validate, and test the models. Then some preprocessing was made to standardize images to 3x64x64. Following that, the original dataset was augmented with some spinning, flipping, and shifting.



Results

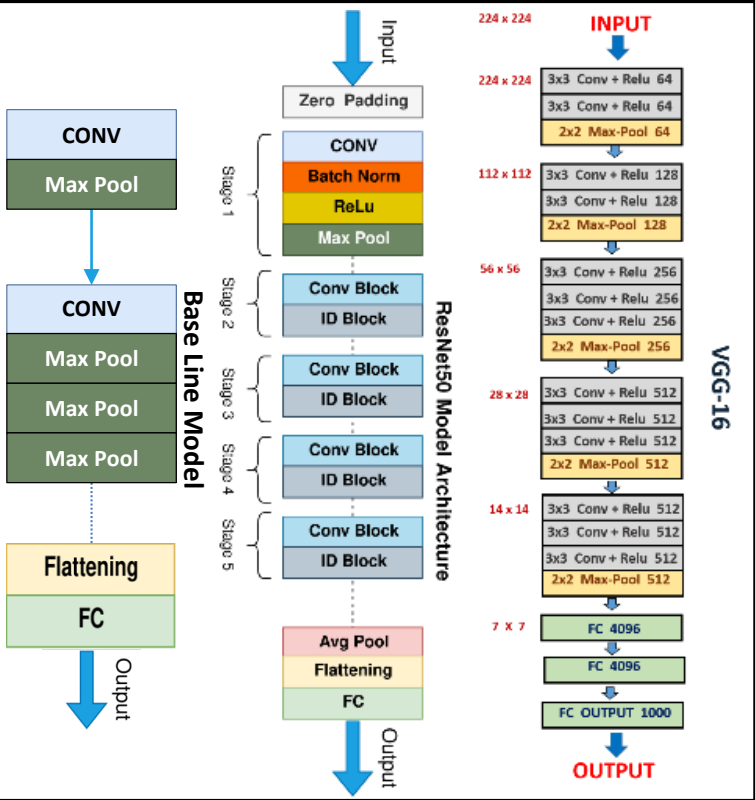
● The accuracy metric is used to evaluate the three models. The model with the highest accuracy will be fed with the augmented data that we have generated.

Model	Acc			loss		Ephoc
	train	valid	test	train	valid	
VGG 16	100%	63%	47%	0.006	1.6	600
BASELINE MODEL	74%	56%	39%	1.1	1.7	600
RESNET 50	46%	35%	21%	1.85	2.05	600
VGG+BL	100%	70%	48%	0.03	1.4	600

● Results of the VGG with the Baseline model on the Augmented data.

Model	Acc			loss		Ephoc
	train	valid	test	train	valid	
VGG+BL	100%	94.9%	49%	0.1	0.1	50

Methods



Conclusion

To sum up, we used” Deep Learning-Based Vehicle Classification for Low-Quality Images” paper as a reference to build our models with an extra step by using data augmentation with the champion model which is “VGG-16 + BL” in our case. Furthermore, we aim to generalize our model by adding more different locations of different countries. Also, try to enhance our model test accuracy by adding more places of the same country to train our model with. Over and above We intend to build captioning model to describe the image which will help in recognizing the location.



● Pyramids on Egypt