A Comparison of CNNs for Image Classification

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Summary

There are a multitude of different Neural Network options for image classification

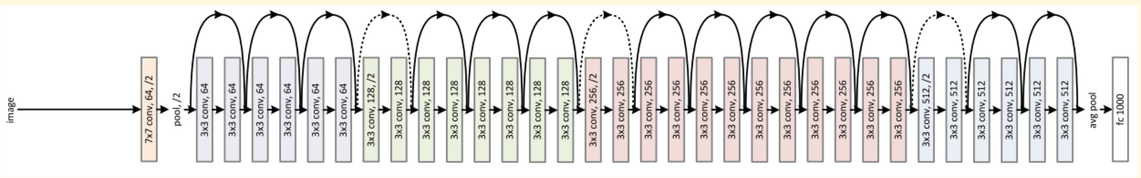
For a simple problem, (Cats vs. Dogs) how does each method perform?

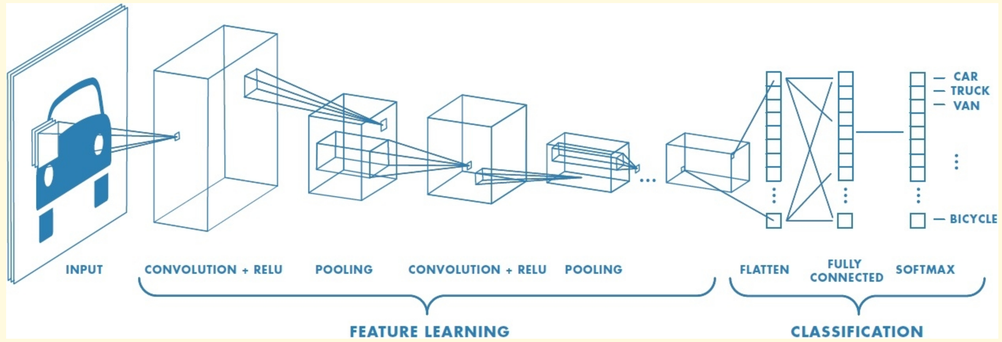
Dataset: Kaggle -Dogs & Cats: Training - 8000 Images, Testing – 1000 Images

Methodology

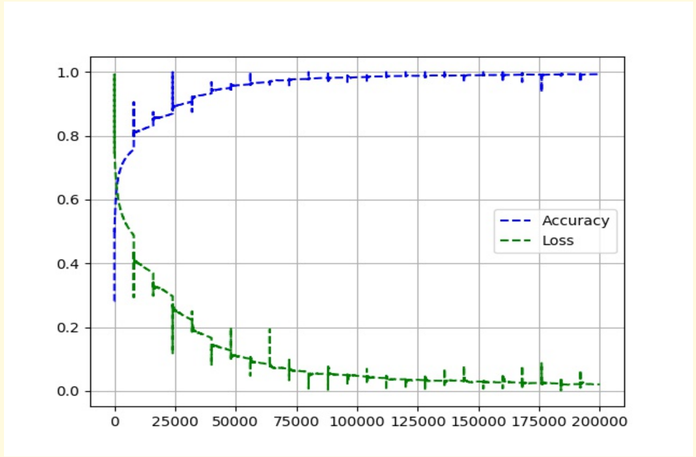
Built and trained a Sequential Convolutional Neural Network in Keras & TensorFlow (Binary Classifier)

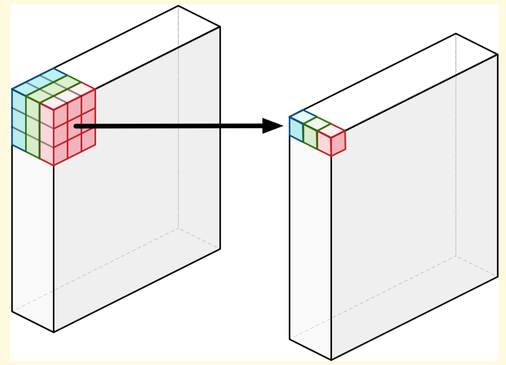
- Train with Kaggle Dataset (18 Hours)
  - Loss: 2.07% Accuracy: 99.32%
  - Worked well on Dogs, didn't work on Cats in Practice
- Pretrained ResNet50 and MobileNet Models
  - ImageNet Dataset (Similar Classes)
  - Resnet: 80% Accuracy, MobileNet 90% Accuracy
- Google Cloud Vision API
  - Correctly Classified 100% of testing data (Before API limit was reached)

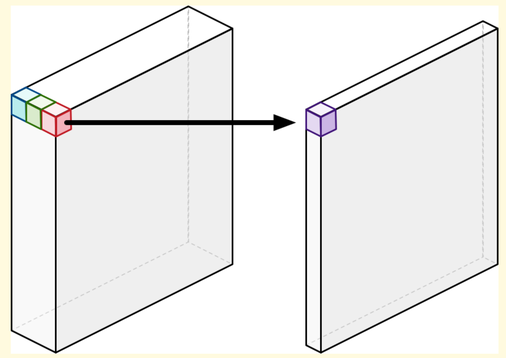




	Homemade	ResNet50	MobileNet	Google
Class	Cat	Siberian Husky: 40% Seat Belt: 7.96% Siamese Cat: 7.82%	Weasel: 12.55% Siberian Husky: 10.84% Siamese Cat: 8.74%	Cat: 98.99%, Whiskers: 88.04% Flooring: 65.02%







References

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Deep Residual Learning for Image Recognition: https://arxiv.org/abs/1512.03385

MobileNets: Efficient Convolutional Neural Networks for Mobile Vision Applications: https://arxiv.org/abs/1704.04861

Google Cloud Vision API: https://cloud.google.com/vision