

BirdNet

Experiments in Classifying Birds

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Introduction



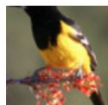
Explore how neural networks are used
classification tasks

How we could reduce complexity while
maintaining classification accuracy

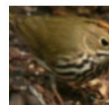
Data



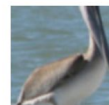
Orchard Oriole



Scott Oriole



Ovenbird



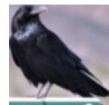
Brown Pelican



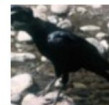
Whip poor Will



Horned Puffin

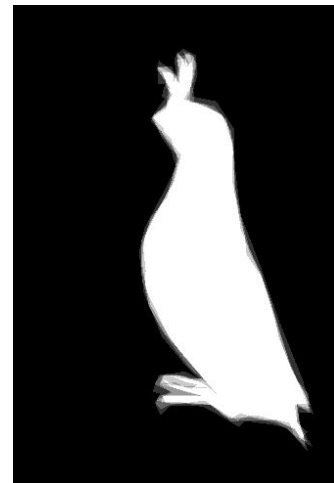
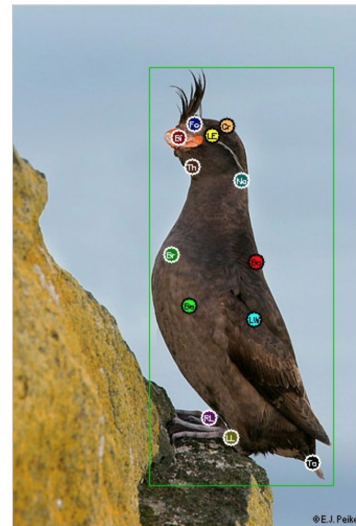


Common Raven



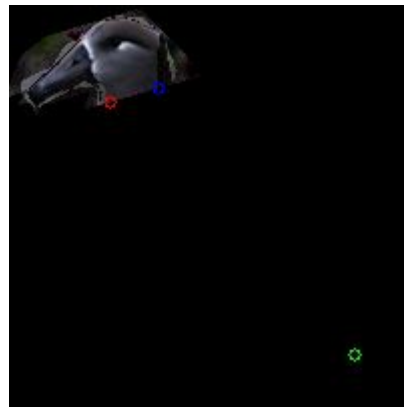
White necked Raven

- Caltech-UCSD Birds-200-2011
- 200 bird species with 11,788 images
- Binary image segmentations and several labeled points



Data Reduction

What's the minimal amount of the image needed to distinguish between birds?

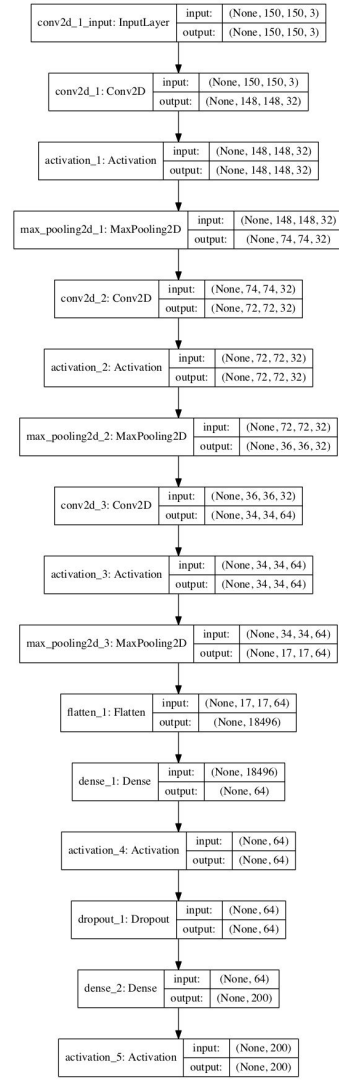
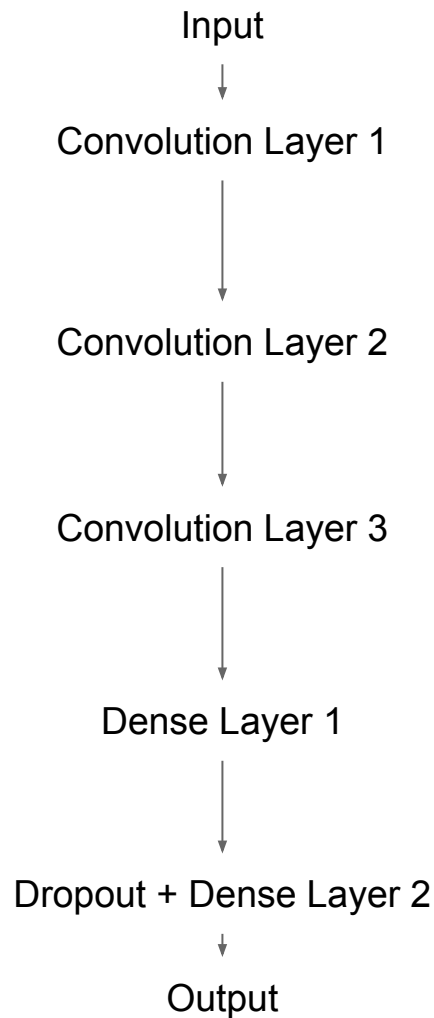


Classifier

Dataset augmented with image jitter

No correct way to organize a neural net

Balance between number of layers and complexity



Results



Model	Testing Accuracy%	Training Time
Baseline	0.50	N/A
Un-segmented images	N/A	Way to long
Segmented images	18.75	2:52:53
Segmented, heads only	7.85	2:22:12

300x300px image input

100 training epochs

50/25/25% train/validation/test split

Challenges

- Bird positions not normalized, couldn't figure out if (x, y) position of the bird learned as a feature
- A saliency test shows a lot of attention given to the 'nape-throat' edge, not desirable

Future Work

- ▣ Attribute Classifier
- ▣ Ensemble Learning

Thanks!

Any questions?

It's a free-for-owl

<https://github.com/glebpro/computervisionproject2018>