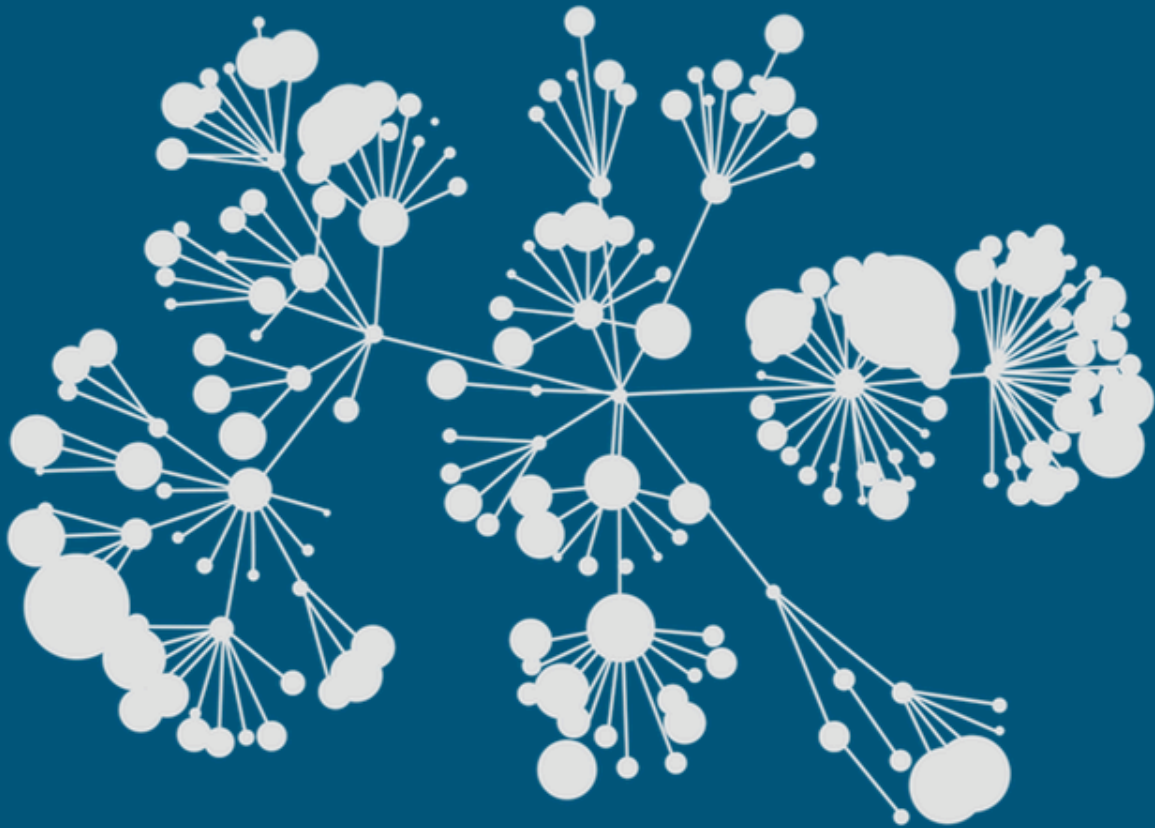


Nature Conservancy Fisheries Monitoring



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Agenda

1. Background
2. Summary
3. Feature selection & engineering
4. Training methods
5. Important findings
6. Questions

Background

Dmytro: Master's degree in Physics and over 15 years of software engineering

Xulei: PhD in Electrical & Electronics Engineering, Research Scientist at IHPC, A*STAR, Singapore

Liang: PhD student at North Carolina State University and intern at SAS Institute Inc

Russ: PhD in Statistics, Director of Scientific Discovery at SAS

Four different Kaggle medal levels!

Summary

Dmytro: Single Shot Detection in keras, Xulei
Faster Region Convolutional Neural Nets in caffe,
and Russ & Liang also used Faster RCNN but in
mxnet and tensorflow.

Good crops of fishes, extra data from ImageNet,
cluster-based folds for cross validation

Dmytro: about 3 weeks on i7+1080 GPU; Xulei:
around 35 hours on a single GeForce GTX980 12
GB GPU; Russ and Liang: approximately 2 weeks
on a single Tesla K80 12 GB GPU (Amazon
p2.xlarge instance)

- Standard pre-trained architectures: vgg, resnet, inception, xception
- Standard data augmentation tricks: flipping and rotating to try and make the trained model more generalizable

- Standard stochastic gradient descent
- Simple 3-way ensemble at highest level
- Component models from each person are themselves ensembles

Important and
Interesting
Findings

- Tried to stay disciplined and trust cross-validation
- Keypoint and mask predictions appear to work well visually, but did not seem to improve classification performance on public test set—would be worth exploring on private set and future data
- ALB, BET, and YFT difficult to distinguish

Questions

1. Was Ralph Neumann hand-labeling the whole time?
2. What was Paulo Pinto's final model?
3. How does an ensemble among the top five solutions perform on the public and private sets?
4. How much different will new data become?

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