

Right Whale Recognition

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Motivation

- Project from kaggle.com
- Less than 500 right whales remaining
- Biologists identify whales by hand
- Only a few researchers can do this

Goals

- Data set is photographs of right whales
- Problem 1: Find right whales
- Problem 2: Match whale to identification number

Strategy Overview

- Use photo recognition to find whales
- Crop found whales from photos
- Use various algorithms to identify

Data Example

Recognition
○●○○○○

Recognition

Identification
○

References

Data Example

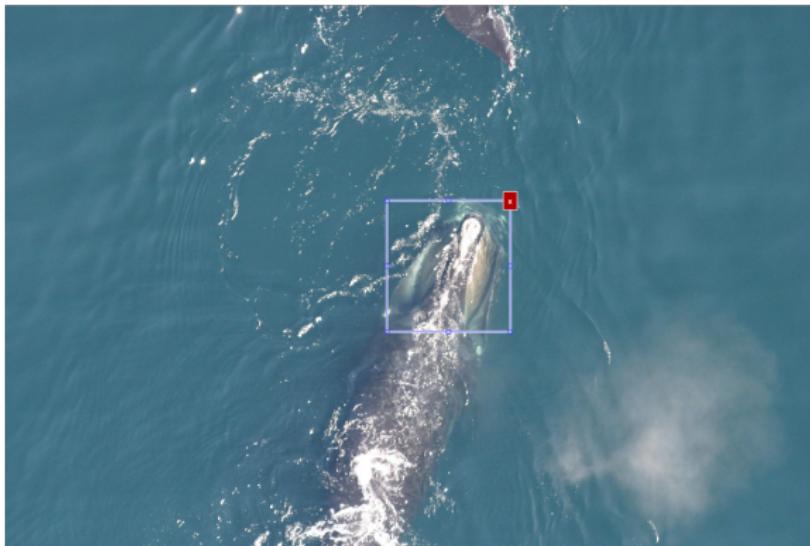


Noise in Data

- Other whales
- Dolphins
- Birds
- Surface reflectivity
- Dirty/clouded water

Training Data

- List of photos with whale ID provided
- Label whales by hand to teach recognizer.



Matlab Cascade Object Detector

- Machine learning tool
- Trains in stages
- Requires positive and negative examples

Matlab Cascade Object Detector

Parameters:

- Number of Training stages
- False Alarm Rate

Results



Approaches

- Neural Network
- Deep-Belief Network

References

- (1) *Creating a "face detector" for whales.*

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- (2) *Identify endangered right whales in aerial photographs.*

<http://www.kaggle.com/c/noaa-right-whale-recognition>,
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- (3) *Labeling images for classification model training.*

LabelImagesforClassificationModelTraining, Accessed: 2015-09-15.

- (4) *New england aquarium.* www.neaq.org/index.php, Accessed: 2015-09-15.

- (5) *Noaa fisheries.* www.nmfs.noaa.gov, Accessed: 2015-09-15.

- (6) *Right whale recognition data.*

<http://www.kaggle.com/c/noaa-right-whale-recognition/data>,
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- (7) *Train a cascade object detector.* www.mathworks.com/help/vision/ug/train-a-cascade-object-detector.html, Accessed: 2015-09-15.