Right Whale Detection Challenge

Future

Apply top two winning methods, along with other methods developed in the Bioaccoustic Research and also deep learning and computer-vision-based techniques

Use Bark scale (psychoacoustic) insted of Mel scale (perceptual scale of pitches - octaves)

- Flatten the matrix and random forest gave 0.917
- By using an ensemble of random forests built on small local submatrixes got 0.93-0.94
- With template matching (best 400 templates based on individual performance on a small validation set) selected one subpic (mean_amplitude -> max) per right whale call I reached 0.970
- At the end I used the ordering information and finished with 0.973

Other Approaches

Deep learning (a convolutional neural network) of the image of spectrogram and treat it as an image handwriting recognition.

Python - librearies Sci-Kit-learn, Sci-py, Num-py for data analysis
Classifiers - gradient boosting and random forest and SVMS

Leaderboard

SluiceBox - 0.98384 (70 entries)
alfnie - 0.98379 (27 entries)

Received the docs and source codes from both winners. Now building the new automated right whale detection-classification system (run for 44 month)

Winning Algorithms

Both winning teams used tight-boxing a spectrogram

Set of features for each tight box
Temporal ordering of labeling
=> consecutive positives

multiple template matching approach

Viterbi algorithm

Labeled positive even spectrogram looks negative due to

- low signal-noise ratio
- from non-biological source

labeled negative even though spectrogram looks positive

- portion of humpback whales up-call
- from diff species

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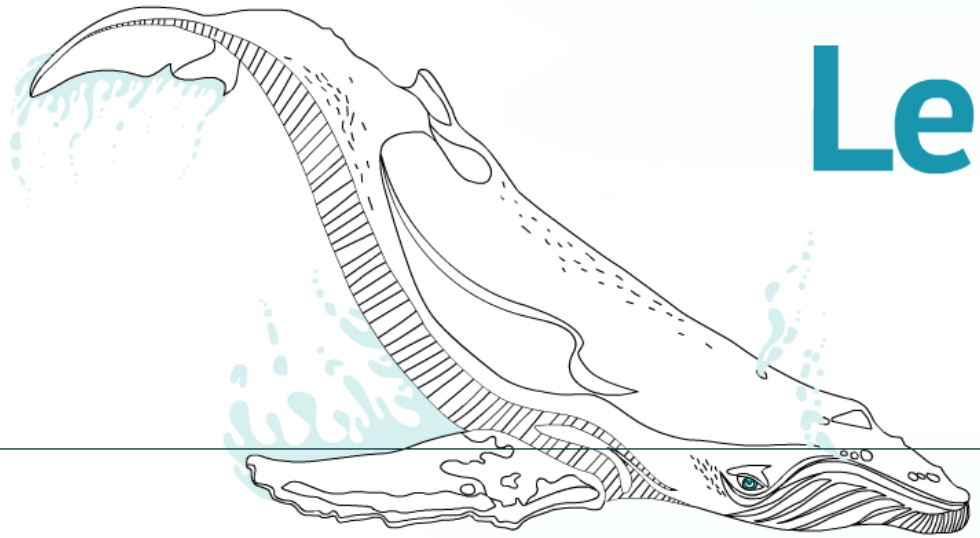

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