Autodetection tools are popular in passive acoustics as a cost cutting tool for analysts. Detector performance is commonly compared via TPR and FPR, but factors such as run time, ease of setup and use, and platform compatibility are also important considerations to performance. The LFDCS algorithm designed to be compatible with real time detection on wave gliders so it is lean computationally, but it is also applied as a tool to aid analysts working with archival data where low computational needs is not as important as the time it takes an analyst to process putative detections.

Despite not being optimized for this tradeoff from the perspective of an analyst, the LFDCS is one of the premier tools for machine assisted detection and classification of low frequency baleen whale sounds. For analyses that require high accuracy thresholds, the LFDCS can provide more false positives than desirable, especially when confronted with persistent low frequency sounds generated by noisy moorings, which is a common case for the use of AURAL recorders in the arctic.

We submit an alternative approach for machine assisted analysis of low frequency sounds, optimized for the use of analysts on archival data. This approach relies on a representative library of both the positives and negatives of a BLED run on reference data, which you build through ground truth selection tables of the data you want to include. It then uses measurements of each putative call to model the likelihood of positive detection using a cross validated random forest models. This way, the model not only learns the identifying features of positive detection, but also learns distinguishing features of the negatives that commonly can trick pitch tracking algorithms. It ‘learns from its mistakes’. This is a flexible architecture that has been successfully applied to right whale upcalls and gunshots, and can be set up to identify any stereotyped, distinct call anywhere in the frequency range of your data.

The detector is tightly associated with Raven Pro 1.5, an acoustic analysis tool that most in the field are well familiar with, allowing setup of the Raven BLEDs, performance evaluation of the pitch tracker and model, and validation of output data convenient in this interface.