Silbido contour detector

Please read the ReadMeFirst file before attempting to use this software.

The Silbido contour detector can be used to find frequency modulated tonal calls in an automated manner. It generates a set of connected tonal calls that are represented as a graph, and then analyzes the graphs to extract individual whistles.

This document explains how to use *silbido*, for details on the algorithms, please consult our article:

M. A. Roch, T.S. Brandes, B. Patel, Y. Barkley, S. Baumann-Pickering, M.S. Soldevilla (**2011**) Automated extraction of odontocete whistle contours. *J. Acous. Soc. Am.*, **130**(4), 2212-2223.

Quick start

Tonals may by invoking the dtTonalsTracking function:

```
detections = dtTonalsTracking('test.wav', start_s, end_s);
```

which runs the contour detector over the data in test.wav from the start time to the end time, both specified in seconds. To process the entire file, use 0 for start_s and `Inf` for end_s. The result is a collection of Java objects. They can be passed to other *silbido* functions such as dtTonalAnnotate (see the annotation manual) or operated on using the Java collections interface.

Producing detections

The graphs associated with the detections produced by dtTonalsTracking can be retrieved by adding an optional output argument. While only three input parameters are mandatory, there is a wide array of optional arguments that can be specified using keyword/value pairs where the keyword is quoted, e.g. 'Framing', and the values follow.

Common arguments that a user may wish to specify:

'ParameterSet', ParameterName - lets the user specify a default group of parameters. There are currently two valid parameter strings that can follow ParameterSet: 'odontocete' and 'mysticete'. While the names are general, the odontocete group is designed for whistles between 5 and 50 kHz while the mysticete group is for very low frequency mysticetes such as blue whales. Using ParameterSet may override many of the defaults listed below. Currently, the parameters are stored in dtThresh.m

'Framing', [Advance_ms, Length_ms] - frame advance and length in ms. Defaults to 2 and 8 ms respectively.

'Threshold', N_dB - Energy threshold in dB

'Interactive', bool - Wait for a keypress before processing the next frame. Only valid when plot options are used (default false).

'Plot', N - Shows formation of tonals interactively
0 - No plot (default)
1 - Show peaks '^' and active set '*'
2 - Also show graphs as they are formed. Graphs that are still active are plotted with :, those that are closed with -.
3 - Add information about orphans and their subgraphs (slower)

ActiveSet_s, N - Graphs are added to the active set once they are N s long.

'Movie', File - Capture plot to AVI movie file. Plot must be > 0. File must have .avi extension, but to play it in Powerpoint the resulting file's extension must be changed to .wmv.

'Noise', Method - Method for noise compensation in spectrogram plots. It is recommended that the same noise compensation as used for creating the ground truth set be used. See dtSpectrogramNoiseComp for valid methods.

'DetectorRange', [LowCutoff_Hz, HighCutoff_Hz] - low and high cutoff frequency for search in Hz. Defaults to 5000 and 50000 Hz respectively

Both the tonals and graph can be visualized using the function dtTonalsPlot which is the function used to produce the plots in Roch et al. (2011).