

## Cricket 1.0 User Guide

Cricket is software designed to calculate the acoustic energy (the overall intensity summed over a set of frames) of a selected interval of speech and convert the acoustic energy value to a perceptual energy value incorporating a number of well established factors relevant in speech perception. These perceptual transforms include an outer and middle ear transfer, frequency smearing effects, and temporal adaptation and recovery. The output of all these filters summed together over the duration of the selected interval yields an overall perceptual energy value, which provides a quantitative measure of prominence that can be compared with other acoustic measures of prominence such as duration and acoustic energy.

Guidelines for using the software appear below:

### 1) Downloading Cricket 1.0

To download Cricket 1.0 go to <http://www.linguistics.ucsb.edu/faculty/gordon/projects.html>

### 2) Open/close a file

To open a soundfile or a wavefile go to File → Open.wav. To close an open file go to File → Close.wav. To quit the program go to File → Exit. When you open a file, a waveform and a spectrogram will automatically appear.

### 3) Before you start measuring

Before you start measuring a syllable be sure the filters and the logfile are turned on. To turn on the filters go to Filter → Outer Ear Bandpass/Inner Ear Bandpass. A checkmark indicates that they are turned on. To enable to logfile go to Log → Turn on Logging. A checkmark indicates that the logging is turned on. The logfile with all the measurements is automatically saved in the Folder 'Temp' in the folder 'UCSB Linguistics' in the Program Files on your computer. It may be opened in Excel or Notepad.

### 4) Measuring acoustic and perceptual energy of syllables

To measure the energy of a (C)CV(V)C(C) syllable click on either the spectrogram or the waveform to mark the beginning of the onset. A red line indicating the boundary will appear. Then click on 'Set – Start of onset' in the 'Set Boundaries' window below the spectrogram. Repeat this procedure for 'Set – Start of nucleus', 'Set – Start of coda', and 'Set – End of coda'.

For onsetless syllables click on 'Set – Start of onset' and 'Set – Start of nucleus' after you set the boundary at the beginning of the syllable. For open syllables click on 'Set – Start of coda' and 'Set – End of coda' you set the boundary at the end of the syllable.

Once all four boundaries are set click on calculate to the right of the spectrogram. This will calculate acoustic and perceptual energy values for the entire syllable as well as for segments of it (such as rime, onset, and nucleus).

#### 5) Zooming feature

To zoom in or out go to View → Zoom Horizontal/Zoom Vertical. The horizontal zoom feature might help you to find the exact start/end of a syllable segment for any syllable. It is applied to both, the waveform and the spectrogram.

#### 6) Changing spectrogram settings

To change spectrogram settings go to Spectrogram → Window Size / Window Shape / Dynamic Range.

#### 7) Perceptual spectrogram

To view a perceptual spectrogram go to Spectrogram → Show Perceptual Spectrogram. A separate window displaying a perceptual spectrogram will open.

#### 8) Troubleshooting

An error message indicating ‘out of the bounds of array’ shows after clicking on ‘calculate’. Adjust the onset boundary a little bit and click on ‘calculate’ again.