**Song annotations using Raven Pro**

**Song matching experiment**

**File organization**

All relevant files are located in:

R:\Marlow & Phillip\SongMatchingExperiment\OriginalRecordings

There are separate folders for each bird and experimental conditions. Folders are named by bird name followed by the experimental condition.

E.g. DgLb A and DDLb dawn

Within each folder, there are several sound files (.wave file format).

Experiment recordings

1007 ddlb A exp part 1

1008 ddlb A exp part 2

Playback file

ddlb A

Playback source files

control ddlb A

fast ddlb A

slow ddlb A

**Open files for Annotations**

Open sound file from the folder location.

To open a sound file, choose **File> Open Sound Files**.. Or press **Ctrl + O**

Alternatively click ‘open sound files’ button on the tools bar.

Select relevant folder and desired sound file from the dialog box and click “Open”

It will open a new dialog box, that will allow you to configure new sound window.

Press **OK** to open entire sound with the default preset.

This will open the sound file with views of wave form and spectrogram.

**Adjust the spectrogram parameters.**

Right click on Spectrogram, Select “**Spectrogram parameters**”, adjust Window size, and time grid overlap. (I use 512 samples and 75 percent respectively, in Hann Window type).

Adjust brightness and contrast to make songs clear. (60 for both brightness and contrast seem fine.) You can adjust the window size, brightness and contrast using sliders at the top.

Adjust the spectrogram axes to have a better scale. Using the same axes scale across different files will be helpful in identifying song types. Right click on the spectrogram, select “**configure view axes**”. In the dialog box, change the scale of Frequency to 14000 hertz/line. This will capture all of the bird vocalizations, and their harmonics, if there’s any.

You can also use “+” and “–“ buttons at the bottom left corner of the window to configure the axes.

**Note:** You can save these settings as a window preset using “View>Window Preset>Save As…”.

**Sample annotation tables**

Annotations are recorded in “Selection tables”. In a default sound window, the selection table is hidden. Click on the dotted line at the bottom of the sound window and drag it upwards to reveal the default selection table.

For our analysis we need to annotate playback songs (Stims), birds responses and comments by the recordist. We need to maintain consistency in table headings across sound files. So, we created sample tables, with headings for each annotation column. It is easier to obtain same columns in the same order by using these sample tables.

To open sample tables, choose **File> Open selection table** or click on “open selection table” button on the tools bar.

Select “**Sample. selections.txt**” file in the folder (R:\Marlow & Phillip\SongMatchingExperiment). Press ‘open’. The new table becomes table 1.

Sample tables contain column headings which we need in our analysis. Each table contains one sample selection at the beginning of the sound file.

**Annotation of playback file and experiment recording files**

Annotate all songs in the playback file.

Save it as a text file.

Open text file. Select all. Copy and paste to an excel sheet.

Open experiment recording. Find the first playback song. Measure begin time of the song.

In excel file with playback annotation data, create two columns after begin time and end time.

In new columns, add Measured begin time (for the first playback song) of the experiment recording, to the begin times and end times.

Copy these data columns and paste in a new excel file. Delete first begin time and end time columns (without addition of begin time from the experiment recording). Save the file as a text file (tab limited).

Open text file in the experiment recording window. The selections should match playback songs. If misaligned, you can adjust the borders.

Then open sample selection table for other annotations. When prompted, click “merge”. It will add new columns to the existing table.

Annotate other focal bird’s songs and comments.

For post-dawn experiment, we need to add playback selections twice.

**Save the selection tables**

Selection tables are saved as text files (.txt format).

To save a selection table, **right click** on the table tab, select “**Save table as**”,

In the dialog box, select appropriate folder (in which the relevant sound file is located)

File name will appear as “Sample.selections.txt”, replace “Sample” by the name of the sound file.

Selection table should appear as follows.

1007 DDLb A exp part 1.selections.txt

**Note:** make sure you save the selection tables in the same folder where sound file is located.

If you opened up more than one table, selections for different tables are shown in different colors (same as the color of table tabs). Only one set of selections (one table) is active at once. You have to activate relevant table to make any changes in selections such as adding new selections, deleting existing selections, and change selection borders.

**Delete existing sample selections.**

There is one sample selection in each table. These sample selections may not correspond to any meaningful sound. Therefore, delete sample selections, before making new selections.

Click on one table tab to activate the table. Right Click on a cell in the first column. Select “Clear selection border”. This will open a dialog box to confirm deletion. Press “yes”.

You can also use Tools bar buttons for “Clear active selection border” and “Clear all selection borders in current table”.

**Creating selections and add notes in the tables**

Zoom spectrogram to a shorter window (around 3 seconds) and scroll through from left to right. When there is a signal (bird sound or speech) play the sound. By visually inspecting signals on the spectrogram you can identify ADWA songs, calls, duets, etc. Click and drag on wave form to make a selection. Start 0.2 s before the starting point of the signal, and finish 0.2 s after the end point of the signal. (You can change the selection borders later, if you are not satisfied with the initial selection.) To commit the selection border, press “Enter”. It will open a dialog box with all the necessary fields (columns in relevant selection table). Once all relevant fields are filled, press “OK”.

Some fields do not change across selections. For example, Bird ID remains same within the file. So, it is easier, to carry those values to future selections as default values.

Click on the box before “Use specified values as defaults”. In all subsequent selections, these values will appear as default values. So, you don’t need to enter all these fields. But, be careful to screen all values and modify based on the new selections.

Note: You can edit any of the values later, by clicking on the relevant cell.

**Note:** Once all selections are made, Click on “Begin time” on the table. It will reorder selections based on the time. The **right click** on “Selection”, and select “**Renumber selections**”. This will renumber all selections, based on the begin time of each selection.

**Saving workspaces**

By saving as a workspace, you can save all open files together. Opening a saved workspace opens all the files included in the particular workspace. Therefore, it is recommended to save each sound file with its accompanying selection tables as a separate workspace.

To save a workspace, choose File> “Save workspace as”

Follow the same protocol, by including the file name of the sound file,

This will help you to open sound file and selection files together.

**Annotations**

Bird – Bird ID

Experiment

A

Dawn

Alt

Signal Type

S – Stim

R – Response (from focal bird)

C – Comments by the recordist

Stim Type (Only for stims, in previous column)

F - Fast

C - Control

S – Slow

Response for Stims

Y – if the focal bird responded (before the next stim), otherwise leave it blank

Overlapping (If the response song by focal bird is overlapping the stim)

Y if overlapping, otherwise leave it blank

Notes