Huddersfield Acoustical Analysis Research Toolbox (HAART)

Quick Overview
(Beta Ver. 1.0)

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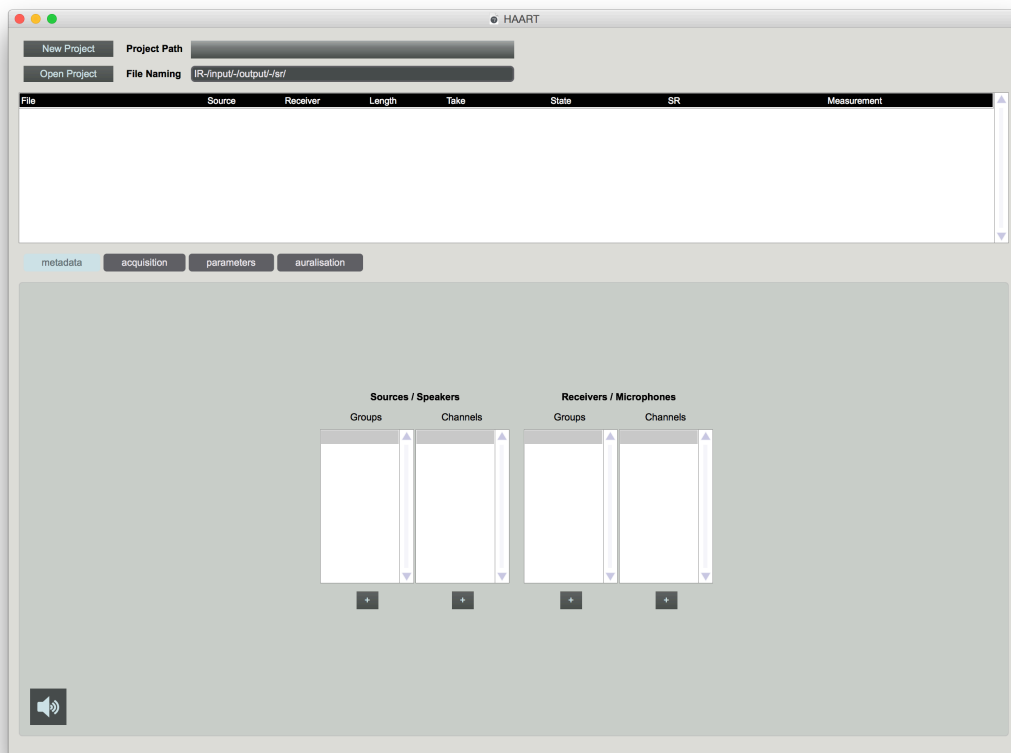University of Huddersfield

* This beta version is fully functional but only runs on MAX 7.

1. Creating / Opening a project

To create or open a project, click on either of the buttons in the top left corner. This will open a window that will allow you to select a location to save / open a project
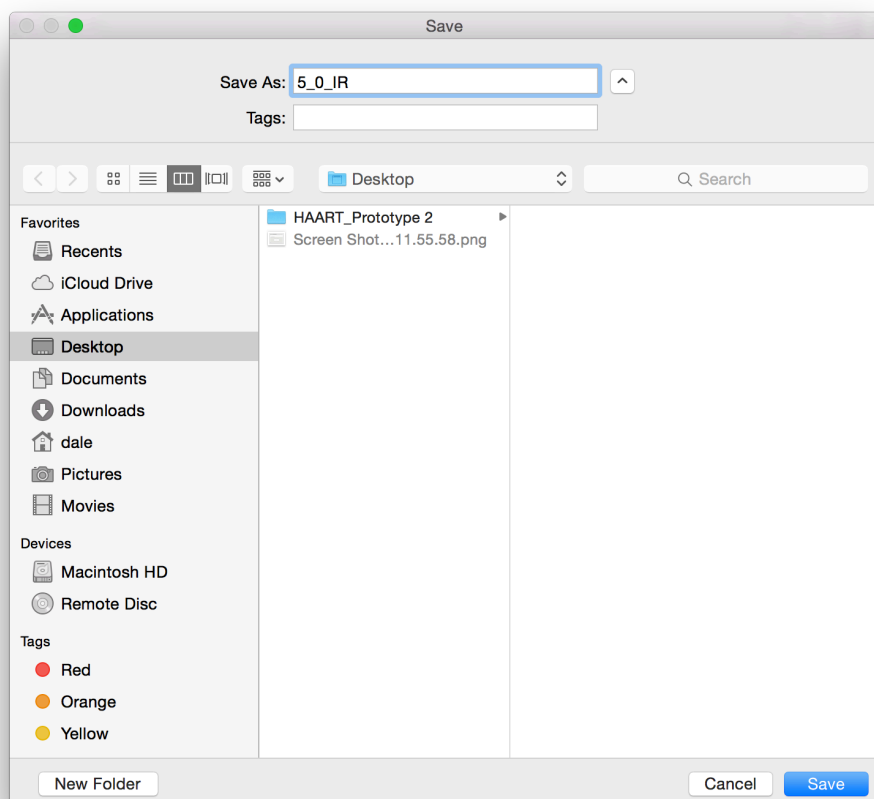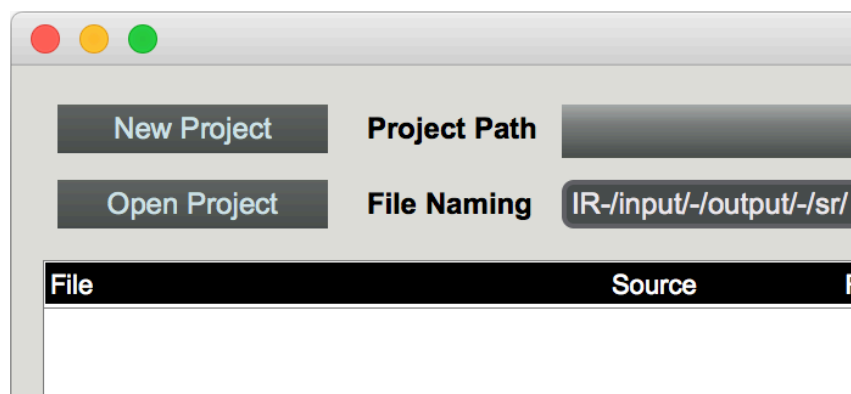
2. Metadata

The metadata page allows you to name speaker and microphone channels. This metadata is used for channel and file naming. Groups and channels are added by clicking on the '+' buttons underneath each column. These are renamed by double clicking on the entry, typing the name and then pressing return to commit the change. For example, a 5.0 surround sound IR setup would be named like so:
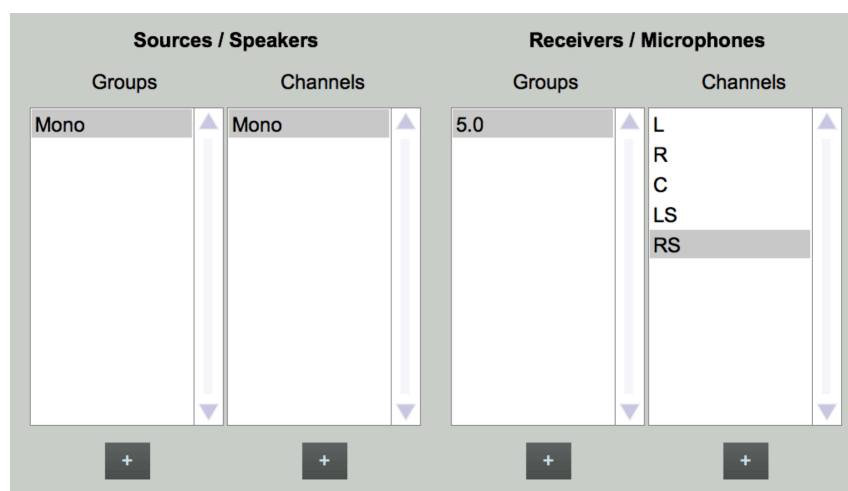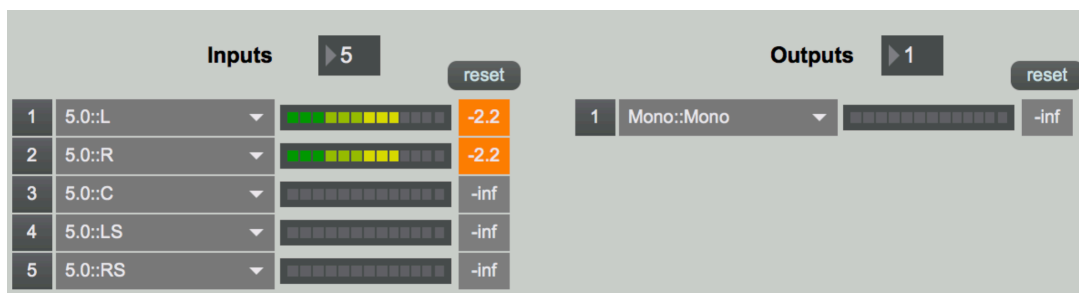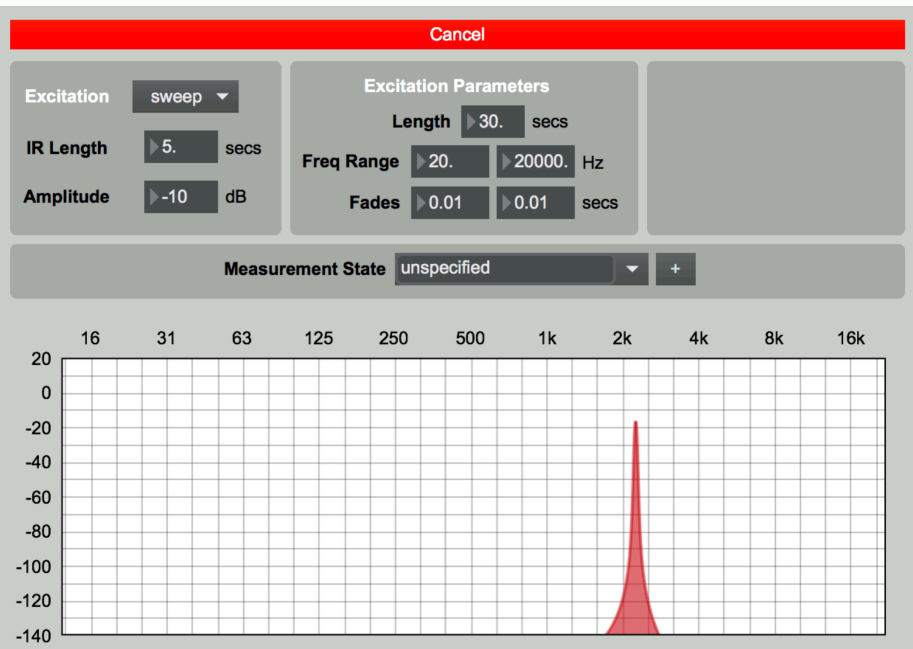
3. Acquisition

This is the acquisition page:
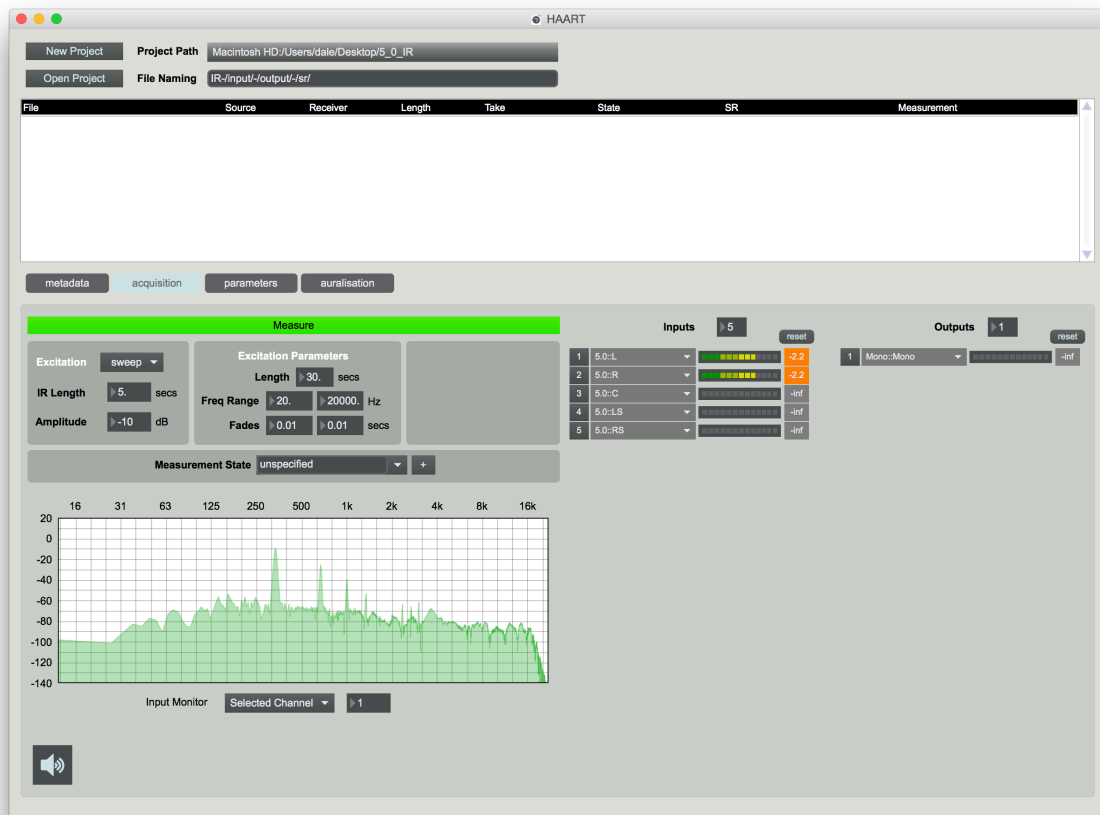
To acquire an IR, first change the number of inputs and outputs on the right hand section to match your setup.

Next, choose which excitation method you wish to use, set the excitation parameters. To start the measurement process, click on the green **'Measure'** button.
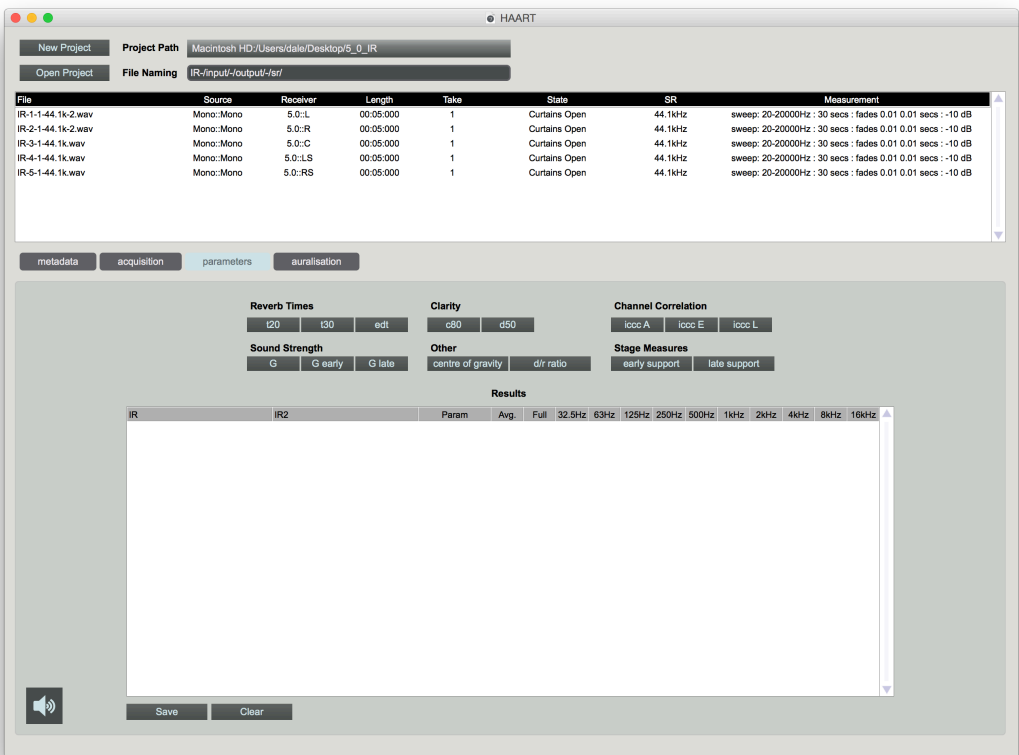

You may cancel the measurement process at any point by clicking the **'Cancel'** button.

After the measurement process is complete, the IRs will be shown in the table at the top of the window. The IR WAV files are stored in the project folder.

4. Analysis

Analysis of the IRs is performed in the **Parameters** page.

To start an analysis process, click on any of the following buttons above the results table to reveal the following page:

Parameter

c80

Select Bands

| Avg. | Full | 32.5Hz | 63Hz | 125Hz | 250Hz | 500Hz | 1kHz | 2kHz | 4kHz | 8kHz | 16kHz |

Select IRs

IR-1-1-44.1k-2.wav
IR-2-1-44.1k-2.wav
IR-3-1-44.1k.wav
IR-4-1-44.1k.wav
IR-5-1-44.1k.wav

Calculate

Select which IRs and octave bands you wish to analyse and click on the **'Calculate'** button to begin the calculation. Once this process is complete, you are taken back to the results page where the results of the calculation are shown.

Reverb Times t20 | t30 | edt **Clarity** c80 | d50 **Channel Correlation** iccc A | iccc E | iccc L

Sound Strength G | G early | G late **Other** centre of gravity | d/r ratio **Stage Measures** early support | late support

Results

IR	IR2	Param	Avg.	Full	32.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	16kHz
IR-1-1-44.1k-2.wav	-	c80	21.76	30.39	21.49	-4.47	10.15	15.90	20.71	22.80	22.47	30.90	30.18	31.83
IR-2-1-44.1k-2.wav	-	c80	21.76	30.39	21.49	-4.47	10.15	15.90	20.71	22.80	22.47	30.90	30.18	31.83
IR-3-1-44.1k.wav	-	c80	nan	nan	nan	nan	nan	nan	nan	nan	nan	nan	nan	nan
IR-4-1-44.1k.wav	-	c80	nan	nan	nan	nan	nan	nan	nan	nan	nan	nan	nan	nan
IR-5-1-44.1k.wav	-	c80	nan	nan	nan	nan	nan	nan	nan	nan	nan	nan	nan	nan

Save | Clear

5. Auralisation

The final page in HAART is the Auralisation page:
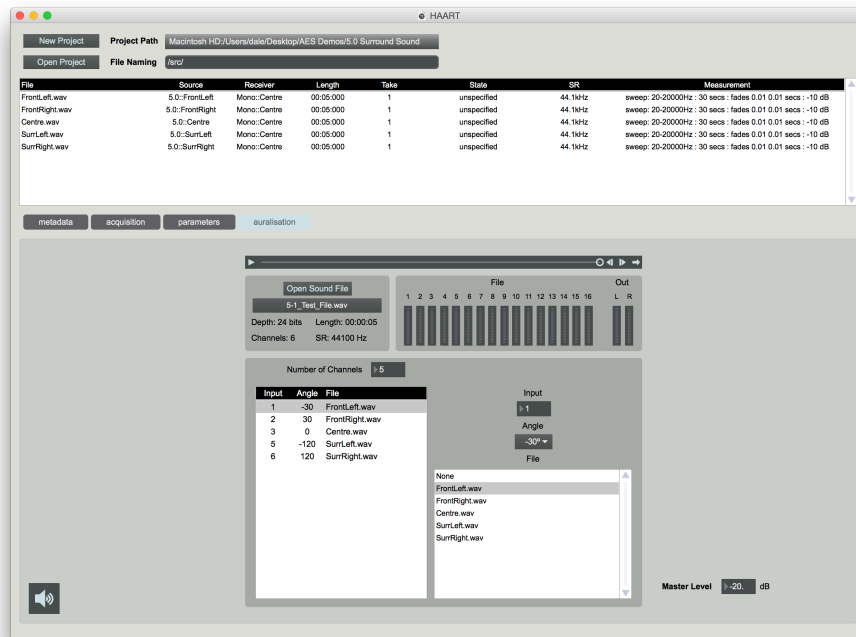
HAART is able to convolve multi-channel audio material with the acquired IRs and binaurally auralise the result over headphones using the provided IRCAM HRIR database.

First, open a sound file by clicking the **'Open Sound File'** button. This will open a file browser where you can select a WAV file.

Set the number of channels and, by selecting each entry, set which IR, audio channel and HRIR angle to use.
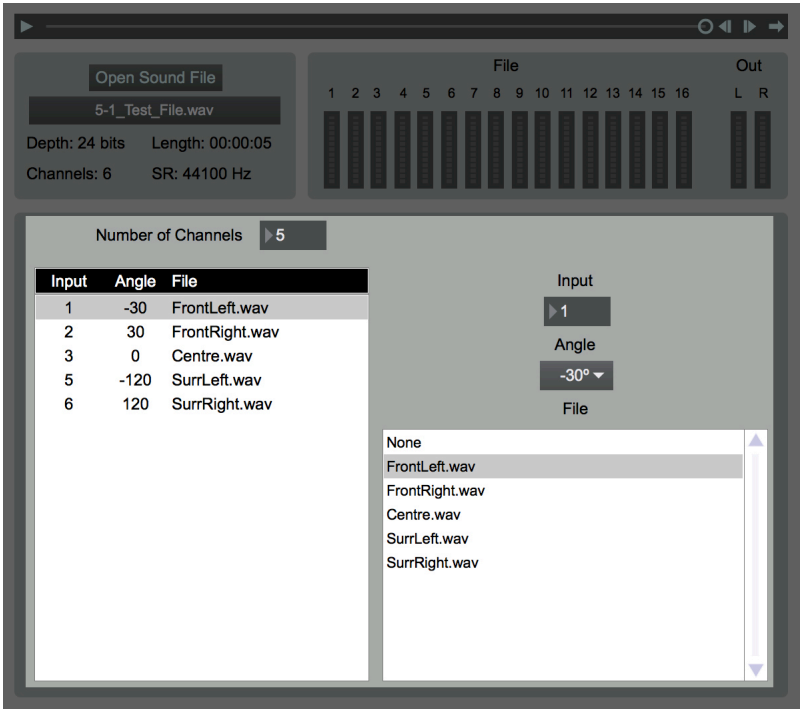
To hear the result, click the play button on the transport bar.