MUSHRATest

User's Guide

1 March 2012

1 Introduction

MUSHRATest is an implementation of the MUSHRA listening test defined by ITU-R recommendation BS.1534-1[1]. MUSHRATest was primarily intended for spatial audio psychoacoustic tests and is thus optimised for multi-channel sound reproduction.

The software is written using JUCE library that supports a number of target platforms including Mac OSX, iOS, Windows XP/Vista/Win7, Linux and Android.

2 License

The software is released under GNU General Public License Version 3.

3 Installation

MUSHRTest can be downloaded from the author's website. The installers are provided for 32- and 64 bit Windows targets. You should have administrators priveligies to install the program.

Installation is simple: choose the platform, download the file, start the installer and follow the instructions.

4 Configuration

You will need to run MUSHRAConfig to setup the audio device and specify subject's names and stimuli directories. It is recommended to use ASIO audio interface (if supported by your hardware) and set the buffer size to at least 512 samples.

MUSHRATest allows individualised stimuli to be used for each subject. This was done to support binaural listening tests with the stimuli rendered using individual subject's HRTFs. If this feature is not required you can specify the same directory for each subject.

5 Preparing the stimuli

There are certain rules and limitation in preparing your stimuli:

- All stimuli should be placed in one folder, with different subfolders corresponding to each trial in the test. The name of the subfolder will be displayed to the user during the tests.

[1] BS.1534-1. Method for the subjective assessment of intermediate quality levels of coding systems.

- Each stimulus in the trial should be saved as a (multichannel) WAV file preferably in 32-bit floating point format[2].
- One of the files should be the reference and must have the word 'reference' included in its filename. All other filenames could be arbitrary.

6 Running the tests

MUSHRATest includes two parts: the training phase and evaluation phase. The former is required by the standard and gives the users the opportunity to familiarise themselves with the program interface and the stimuli they are going to listen.

The user interface is specified by the BS.1534-1 which should be consulted for more details.

7 Results of the test

By default, the results of the tests are saved in the same directory as the subject's stimuli. If this is impossible due to write access restrictions the file is saved in the User's Documents directory (My Documents on Windows).

The name of the results file has the following format: `[date]_[time]_[subject name].txt`. This is a tab-separated text file that can be read by any text editor or spreadsheet software.

8 Compiling from the source code

The source code and Visual Studio 2010 project files are available from the author's website. The code depends on open-source JUCE library that can be downloaded from `http://www.rawmaterialsoftware.com.` The library should be placed in the same parent folder as MUSHRATest. In order to use ASIO audio device interface JUCE requires ASIO SDK to be installed. This SDK can be obtained from `http://www.steinberg.net/en/company/developer.html`. Depending on your computer configuration DirectX SDK might also be required. This could be obtained from Microsoft at:

`http://msdn.microsoft.com/en-us/directx/aa937788`.

9 Bug reports and user feedback

If you found a bug or have problems compiling the code please contact the author using the form on the website. Please make sure that you save the

[2] If you have your files in a different format you can use open-source Audacity software to convert them. Visit `http://audacity.sourceforge.net/` for more details.

log file created by MUSHRATest. The log can be found in the user-specific Application Data Directory. On Windows 7 the full path is:

`C:\Users\<current-user>\AppData\Roaming\MUSHRATest\mushra.log.txt`