Streaming BinauralFIR Node Audio With 360 Video

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ABSTRACT

In moving towards the development of a technical standard for streaming 360 degree audio-visual media and using the Ricoh Theta SDK as a development platform, the author will present a demonstration of a browser-based iOS application using a live, streaming monaural audio signal paired with 360 degree video, with both signals being generated by the Ricoh Theta S camera. The audio signal is intended to be spatialized in 3 dimensions using the BinauralFIR node developed for the Web Audio API by Arnau Juliá Collados in his degree's thesis *Design of a binaural synthesis processor in the browser using Web Audio API* (with supervision by T. Carpentier, S. Goldszmidt and F. Vallverdu). A browser-based application of this type appears to be one of the intended use cases of the BinauralFIR node: "
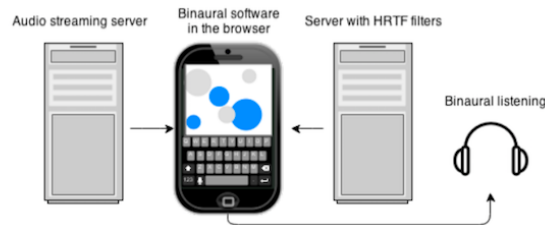
FIGURE 3.6: General diagram of a binaural in the browser application

The BinauralFIR node can be useful to create e.g, an audio streaming application with binaural listening controlled by the user as it is showed in the figure 3.6. In this example, an audio streaming such as e.g., a live radio concert emitted in multi-track is get from a server." (Collados, 2014: 28)

The main goal of the demonstration will be to use the BinuralFIR node to stream live audio from the Ricoh Theta S microphone in real-time, as opposed to streaming a previously recorded audio file as shown in the Binural FIR Example demonstration presented at WAC 2015 by T. Carpentier here: http://ircam-rnd.github.io/binauralFIR/examples/

Although Google/Youtube appears to be working towards a real-time 360 video stitching standard (http://bzfd.it/1VOX5Wh) , the Ricoh Theta S, due to inherent hardware limitations, is not currently capable of this task. The live 360 video stream for this demonstration will therefore be presented as two 180 degree fisheye videos arranged side-by-side in a 1920 x 1080 video player window.

WEB LINKS

Design of a binaural synthesis processor in the browser using Web Audio API:
http://upcommons.upc.edu/bitstream/handle/2099.1/23036/ArnauJulia_Final_Report.pdf

Binaural synthesis with the Web Audio API: http://wac.ircam.fr/pdf/demo/wac15_submission_16.pdf

Binaural module for the Web Audio API https://github.com/Ircam-RnD/binauralFIR