

Notes for HRA TC Meeting (via Zoom), May 19, 2023

Attending:

Jamie Angus
Hyunkook Lee
Hans van Maanen
David Rich
David Jones
Patrick Dennis
Sergio Liberman
Vicki Melchior

Indicated they couldn't attend: Bob Stuart, Bob Katz, Wieslaw Woszczyk, John Dawson

A. General discussion on the just-completed AES 154th convention in Helsinki:

Two of our planned events were held, Jamie's tutorial (Heyser) lecture on "The Ear is not a Fourier Transformer" and Hans/Milind Kunchur/Josh workshop on high end audio ideas, as well as Hyunkook's lecture and demo on binaural and spatial audio. Well attended.

The talks by Jamie, Milind Kunchur and earlier by Bob S. stressed, amongst other things, the importance of the active tuning of the Q of auditory filters under control of the outer hair cells in response to loudness, attention etc. Jamie said this was a primary goal of the Heyser and that many comments afterwards came from people who hadn't known about the active tuning. Supports the need for presentations of basic auditory science and implications for audio engineering.

The convention featured a series of immersive audio demos (by Morten Lindberg, Ulrike Anderson, Kimio Hamasaki, Hyunkook, and Florian Camerer) that enabled a comparison of their various recording methods and goals (assuming you could get in, since there were long lines). We discussed some of it, in particular the opposing use of microphone arrays, signal correlation, and vastly different recording spaces in Morten's versus Kimio's approach. As this is Hyunkook's field, he recommended his JAES paper from 2 years ago that reviews the various 3D techniques and why they work in certain settings but not others. He will make a list of his relevant publications available to the TC. Was also noted that AES needs a better approach to listening demos than the long lines that occurred in Helsinki.

B. Proposed TC events for fall 2023 and beyond.

1. Large scale demo comparing immersive 7.1.4. to binaural mix-downs of the same, using speakers and headphones. This was planned for Javits in NYC, 2023 and would provide an intro to binaural, how it differs from stereo, etc. Current status is that AES cannot support it in Javits because (a) Javits is too expensive for a second dedicated room high enough for 7.1.4, (b) Wifi in Javits is prohibitively expensive, eliminating use of wireless headphones, and (c) wired headphones can't reasonably be left in place if we have to share a room with other demos. The next AES in Europe could work if a dedicated room is available.

There is an additional problem with binaural audio however of finding experienced presenters. Binaural is not yet accepted by elite recording engineers for multiple reasons: (a) poor experiences with Dolby Atmos binaural (for which there is industry pressure) (b) industry focus on multichannel for immersive despite the need for 2-channel, (c) elite engineers prefer channel-based releases, (d) lack of training in spatial audio, leading to a lack of reference as to what binaural should sound like. In other words, a creative approach is needed to show what good binaural can be. A further issue is how to target recording engineers, who may have a fixed mindset, rather than only students.

2. Workshop or tutorial on binaural for NYC, Oct. 2023. Hyunkook will address it. Could evolve from Hyunkook's Spatial Audio Conference at Huddersfield in August, 2023.

3. Hyunkook may repeat his Helsinki tutorial on binaural audio at the fall convention.

4. Discussion about repeating Jamie's Heyser lecture in NYC using Jamie's slide deck

5. Workshop on wireless audio and Wifi for NYC, 2023. (Vicki will address this.) This would be a follow-on from the Helsinki Wireless workshop in which Bob S. was a panelist. There is a lack of knowledge about wireless in general and topics might include the forms of wireless (UWB, Bluetooth, Wifi) and their problems, standards and protocols, need for internet or not, mobile hotspots, configuration of wireless systems, bandwidth and latency requirements for high resolution wifi streaming, high res codecs. Possible panelists –

- speakers from the Helsinki wireless workshop
- CEO of Audeze or their technical engineer
- codecs, including HRA

6. ASRC (asynchronous rate conversion) tutorial or workshop. Possible speaker:

- Bob Adams (now retired)?
- Eelco Grimm (very busy)?
- Needs exploration but a good topic

7. Workshop on floating point at an in-depth level, continuing on from previous events:

- Would cover various f.p. standards, f.p. processor implementations - there are several, from pure floating point to f.p. emulation using fixed point
- Bit lengths and excess bits available in today's processors
- This is specialized toward DSP professionals but if framed in terms of machine

- learning, it might appeal since m.l. people are looking at crude f.p. representation
- A big issue is lack of manufacturer openness about implementation
- Jamie can assess f.p. representations other than IEEE, DEC and IBM for IEEE compliance

8. Hans and a colleague expect to present their work on the impulse response and behavior of microphones for Europe, spring 2024