Minutes of the AES Technical Committee on Coding of Audio Signals

The meeting was called to order at the 146th AES Convention, Dublin, at 11:00, Thursday March 22, 2019 by Jürgen Herre, co-chair. A short round of introduction of the attendees was performed.

The agenda was approved, as shown in Annex 1. The chair welcomed attendees, shown in Annex 2, and thanked them for participating in the TC meeting. He pointed out the option of declining the names of the attendants to be listed in the publicly available meeting minutes according to the European Data Privacy regulations.

The minutes of the last TC meeting at New York had been posted on the TC email reflector and then uploaded to the TC web site.

The Chair explained the scope of the work and contributions of a TC to the attendants that have not participated in such a meeting before.

The Chair noted the activities at the 146th convention that might be relevant to TC members:

- T04 – „Digital Filters, Filter Banks, and Their Design for Audio Applications", Wednesday, March 20, 11:00 - 12:30. (TC-SP sponsored) was well attended.
- W06 – "MPEG- 3D Audio Goes VR", Wednesday, March 21, 9:00 - 10:30 (TC-CAS sponsored) had a good and interested audience.
- P07 – Assessment, Thursday, March 21, 09:00 — 10:30
- W16 – "Object Based Audio Programs", Friday, March 22, 17:00 - 18:00

This convention's Heyser Lecture speaker was David Griesinger.

The committee discussed about events that the TC might sponsor or contribute to at the upcoming convention (147th in New York, 16Oct-19Oct, 2019). Based on this, the following activities were planned or envisaged for the Coding TC:

- Both the Tutorial T04 by Gerald Schuller and the Workshop W06 chaired by Jürgen Herre were considered successful and proposed for presentation for the US audience at NY.
- Furthermore, some previously considered proposals were deemed as still very interesting but need more time to be ready:
    - A workshop on "Audio Coding using DNNs" would be a very interesting topic, but still needs more technology examples before it appears mature – may be ready in 2020.
    - Similarly, a workshop on "Spatial Perception relevant to Audio Coding" may be interesting in the future. A co-driver from the TC on Spatial Audio or from the TC on Perceptual Evaluation would be needed.

As the main item of activity, there was a discussion on an update of the TC's CD ROM project.

Background: In the past, the TC had produced a very successful series of tutorial materials (CD ROM, JAES article, workshop) on "Audio Codecs – What To Listen For" which explained the nature of several categories of coding artifacts and provided example sound excerpts for listener training. Since this effort, a number of new coding tools and technologies have evolved (bandwidth extension, parametric stereo/MPEG Surround, etc). Thus, an update for these new components is in order.

Sascha Dick made a presentation about efforts for creating an enhanced appearance for the new educational project. Three aspects of enhancement were presented and discussed in the TC:

1. The style template of the original has rather small font size and low contrast (grey letters). Better *readability* is desired ("accessibility") as well as a layout that is *tablet- and mobile device friendly*: Jürgen Herre will inquire how to achieve that.
2. Audio playback based on HTML5 is more convenient since playback does not involve player applications and starts instantly.
3. Better means for visualization of spectrogram-style difference between original and processed signals. Sascha Dick presented an example that toggles between two spectrograms (using javascript). This works nicely and is useful for all chapters (including the old ones – this content has to checked). He will revise the code and make it available for the project.

The most likely medium for publication would be USB stick or online/download. Blu-ray Disc would be possible in principle as a medium for distributing uncompressed multi-channel material, but is considerably less common and convenient that online/download. As noted before, binaural audio may be an alternative in this dilemma that allows playback on common consumer devices.

Overview of the assigned tasks and their status:

Topic	Name / Status
Artifacts from Perceptual Noise Substitution (PNS)	Juergen Herre / First signals generated - ongoing
Artifacts from High Frequency Reconstruction (Bandwidth extension) • roughness, inappropriate temporal shaping, • timbre mismatch (too tonal, too noisy)	Sascha Dick / First signals generated + spectrogram-type visualization generated - ongoing
Artifacts pertaining to Parametric Stereo & related technology, incl. surround/3D (spatial degradations, timbre artifacts)	Christof Faller -
Artifacts occurring for applause signals / live recordings • (temporal shaping, timbre, spatial stage)	Sascha Dick / (see below)
Off-sweet-spot artifacts	
Artifacts in rendering	Christof Faller
Transcoding (including cross-coder tandeming)	Schuyler Quackenbush
Multichannel/immersive content (binaural and multichannel wav, channel ID signals) • Public domain • Mono, stereo, 5.1, 7.1+4 Presentation • Binaural to headphones • Mono, stereo, 5.1, 7.1.+4	Schuyler Quackenbush
Editing of documentation text	Marina Bosi

The topic of applause signal artifacts may be combined into the existing chapter on "Speech Reverberation" since both address temporal smearing of signals.

Under AOB, Karlheinz Brandenburg made the attendants aware of the upcoming 5th International Conference on Spatial Audio at Ilmenau, Germany on Sept 26-28 2019: https://vdt-icsa.de/en/2019/

The TC meeting was adjourned at 12:08.

ANNEX 1 – Agenda

AES TC on Coding of Audio Signals
Room Wicklow 4 1, 11:00-12:00, Thursday March 22, 2019
146th AES Convention Dublin

1) Approval of Agenda
2) Review of recent activities for current convention / conference
   - Richard C. Heyser Memorial Lecture Series
   - Other activities
3) Review of / proposals for activities at upcoming conventions,
      conferences, workshops etc.
   - 147th AES Convention, New York
4) TC Membership
5) Educational CD ROM v2 Project
6) Any Other Business
7) Next Meeting
8) Closing of the Meeting

ANNEX 2 – Participants

Name	Company
Jürgen Herre	International Audio Laboratories Erlangen / Fraunhofer IIS
Sascha Dick	Fraunhofer IIS
Yutaka Kamamoto	NTT
Gerald Schuller	TU Ilmenau
Karlheinz Brandenburg	TU Ilmenau / Fraunhofer IDMT
Bert van Daele	Auro Technologies
Nils Peters	Qualcomm Technologies