

Summary WG 03, "Future Sound Tech Solutions" – Meeting #03

At the meeting on **August 9, 2021**, more detailed discussions and planning of webinar events took place. A summary of the meeting is included below.

Challenge: Our Working Group, '*Future Sound Tech*', although many ideas have been tabled up to now, is still lagging to have webinars in the pipe ready for execution. We need to catch up with the other Working Groups.

Proposals for Webinars

#	Subject	Background
1a	AI/Machine learning (ML)	DSC secretariat has contacted Edge Impulse on a possible event using their AI material, however, no response from Edge yet. We are not at present at need of the event, since one or two other AI webinars are being prepared (Hands-on experience on AI using the 'Edge Impulse' on machine learning webinar, e.g. in relation to audio (www.edgeimpulse.com) is attractive.)
1b	AI in signal processing (4-5 short presentations)	Speakers and content for a webinar on AI in signal processing for audio basically ready for an event: <ol style="list-style-type: none"> 1. AI in signal path, Oticon (Niels Pontoppidan) 2. AI in signal path, headset, Epos (Niels: Torben Christiansen, Kim Larsen) 3. Solving "cocktail party problem (Niels Pontoppidan) 4. Deep Noise suppression, Jabra (Clément Laroche) <p>To ensure coordination, each speaker should prepare a few lines of abstract and share it with the other speakers, including contact data (phone & Email), to allow speakers to coordinate with each other, since some presentation may overlap.</p>
1c	AI in signal processing	Contacts to Jan Skoglund, Head of Global IP Sound Office, Google, has resulted in accept from Jan to contribute on AI for signal processing in audio: <ol style="list-style-type: none"> 1. Quality metrics 2. Low bit audio coding using AI support <p>Current plan is to use Jan's contribution as Keynote at SoundDay 2021 in November, 2021, alternatively have him included in one of the webinars. Clarification required, whether Jan Skoglund should participate in webinar or at 'SoundDay 2021' or possibly both.</p>
2	'Futurist' session	Original focus modified. Previous plan for a webinar event, where we invite e.g. 3 start-ups to talk about their plans for the future, may fit better at SoundDay 2021. May also be useful in a potential support activity under an emerging EU supported scheme, REACT, that DSC is likely to be involved in over the coming months.
3	Redress the great achievements of audio – and address the reality of unsolved audio challenges.	Postponed

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4	Audio and 'privacy'	<p>Postponed until further</p> <p>Subcommittee will try to identify a webinar in more details. At least show examples of privacy concerns in relation to audio.</p> <p>A proposal to include Lars Thinggaard, editor of a new book "Tech for life" (coediting together with Jim Hageman Snabe, chairman of A.P Møller and Siemens).</p>
5	Digital meetings and audio	<p>Focus area at present transferred to WG 4, "Creative Sound Solutions WG4 on "Creative Sound Technologies" is preparing a webinar on "Audio in AR/VR, September 30, 2021.</p> <p>WG 4 will also be running another webinar, "5G technology in Pro Audio", a technology that is likely to improve on e.g. latency challenges.</p> <p>If different focus is needed, our WG can at a later point in time re-initiate the topic.</p>
6	Multisensory processing	<p>No proposals for speakers have yet been tabled.</p> <p>Focus: Topic include all senses in use. However, emphasis of enhancing audio quality for at least hearing-impaired people is essential.</p> <p>Bone conduction: 'Auricle' and possibly could be of interest to Jabra.</p> <p>Overlap to Focus Area 8 (Sensors of the future)</p> <p>At present, not a hot topic in Denmark, but international interest exists. A webinar could be structured as presentations and panel discussion. Focus on technical achievements and challenges.</p> <p>What can universities contribute: DTU, AAU-CPH (Stefania Serafin), others?</p>
7	Green footprint of audio streaming	<p>Green footprint on streaming a big issue for the "the big players", but difficult at present to see a specific 'Danish angle' to the challenge.</p> <p>Postponed until further</p>

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8	Sensors of the future	<p>Some overlap with the theme of '<i>Intelligent sensors</i>' (WG 4 proposed webinar), however, Intelligent sensors may primarily focus on signal processing, whereas in '<i>sensors of the future</i>' physical sensors are in focus.</p> <p>Today audio sensors are mostly stand-alone solutions. However, in the future sensors will be integrated into all kinds of products. How will that influence the traditional sensor market? We should also include new materials for audio sensors.</p> <p>Also of interest to include other sensors.</p> <ul style="list-style-type: none"> • HBK • Jabra • GRAS • DPA microphones • International speakers, if relevant, could be Ryan Harnes or Joe Paradiso <p>Other sensors for uses with audio could include:</p> <ul style="list-style-type: none"> • Bone conductors • EG sensors, etc.
9	'Personalization' of user needs	<p>Three WG members agreed to send list possible contacts at their organizations with an interest in the topic area. Action: within a few days.</p> <p>Based on focus of interest from these contacts (bottom up) combined with a clearer outline, we envisage that a webinar can be set up in the area.</p> <p>Original idea of focus: Start up with different groups of hearing-impaired people and then move on to groups of consumers.</p> <p>General agreement that this is a hot topic of interest of several of the involved companies. Possible inputs from international speakers, e.g. Shaun Olivance ?</p>
10	Use of pre-simulated data	<p>Neural networks can be trained using synthetic data to push the use in audio neural network applications. This is cheaper, more efficient and do not require e.g. the Google codec.</p> <p>The topic could be integrated into the machine learning (ML) webinar discussed earlier on. In essence, ML is up to 90% an issue of data generation.</p> <p>The theme could also be part of the AI themes under Focus Area 1, but still seems an area on its own right.</p> <p>Proposed speakers:</p> <ul style="list-style-type: none"> • People working in acoustic simulation (e.g. Efren Fernandez Grande from DTU ?) • Toon van Waterschoot, ESAT, KU Leuven

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11	Perceptual audio evaluation one-o-one	<p>We need better methods of quality measures. Solutions to be based on Individual needs:</p> <ul style="list-style-type: none"> • Overall quality & preferences • Objectify perception of quality using tools <p>Speakers could be:</p> <ul style="list-style-type: none"> • Charlotte Sørensen • Cees H Taal, SKF • Richard Heusdens, Professor, Netherlands Defence Academy, Delft University of Technology • Jesper Rindom Jensen, Oticon.
12	'Sound Day 2021 keynote	<p>Proposal to have Mikkel E.G. Nielsen, Oscar winner 2021 on his editing on the film "Sound of metal" give presentation, e.g. a keynote at the Sound Day 2021.</p> <p>The movie is about a drummer, who loses hearing and obtains a cochlear implant. Mikkel Nielsen was the sound guy in the field and then he was selected to edit the film.</p>

Proposals for collaborative projects

No discussions on the projects at Meeting #02 took place, so details below are from Meeting #01.

#	Subject	Background
A	Technology roadmap for audio	<p>Music productions have in recent years focused on compression, enhancing transfer bandwidth, but sacrificing quality ('old dynamic bandwidth lost'). How can we improve on streaming and other quality aspects?</p> <p>Generations of audio solutions, and how do we disseminate the results to a wider audience?</p> <p>Should not focus on technology on its own right, but rather on use cases, and possibly on the issue of data collection for AI. Technology itself is not the prime focus for Danish companies, instead focus should be on how to optimally use the available technology, i.e. on the problems that need to be solved.</p> <p>In addition to Jonas's proposal, we should address all possible dimensions, e.g.:</p> <ul style="list-style-type: none"> • Products • Product experiences • Services • Etc.
B	Data collection in conjunction with AI and use of pre-simulated data	Data collection for use in AI applications and training in conjunction with training using pre-simulated data could be shared among several companies, like previous projects between DTU, B&O, Harman, B&K, etc. that led to several publications.
C	Tutorials on AI etc. for students and PhDs	AI, data collection, training of neural networks etc. could be an interesting area to develop tutorials for.

Next meeting

Wednesday 22 September, 2021, 14:00 to 15:00

Appendix 1: Participants in the meeting

Mads G. Christensen
Clément Laroche
Morten Kroman
Jonas Raun Hansen
Birger Schneider
Torben Vilsgaard
Shelley Uprichard

AAU
GN Audio - Jabra
WS Audiology
GN Hearing A/S
CHAMAJ Consult ApS
Danish Sound Cluster
Danish Sound Cluster

Professor
Senior Research Scientist
VP R&D Electronics
Manager, Electro Acoustic
Director
Director
Project Manager