

Summary: "Future Sound Tech Solutions" – Meeting #09

Meeting # 09 in working group "Future Sound Tech Solutions" took place on October 31, 2022.

The meeting agenda was:

1. Webinars:
 - a. Follow-up on proposals and ideas from meeting # 06 including additional comments and proposals.
 - b. Proposals for possible speakers
 - c. New themes?
2. Physical events during 2022
 - a. Meetings? Workshops? Others?
3. Collaborative projects, update of proposals, indication of possible project consortia
4. Other ideas for Danish Sound Cluster activities
5. A.O.B.

Summary details

See the following pages.

Ad 1a & 1b: Proposals for Webinars

#	Subject	Background
8	"Emerging Acoustic Sensor Technologies and Applications"	<p>Planned for execution early 2023</p> <p>In the future, sensors will be integrated into all kinds of products. Influence on the traditional sensor market?</p> <p>Potential speakers:</p> <ol style="list-style-type: none"> 1. Magnus Hemer, Sonion 2. Thomas Jensen, Knowles 3. HBK (Claus Blaabjerg to check)? 4. G.R.A.S. (Niels Kjærgaard/others)? 5. Sergei Rotger Griful (Eriksholm) 6. Others (e.g. Auricle-Pedro Costa)? <p>Pedro will contact Efren and discuss options for speakers for the event.</p>
13	Hearables, OTC	<p>Difficult to find speakers. Companies like WSA and GN Audio are reluctant to contribute, since that may create conflicts with current market positioning in these companies. It is not the products themselves but where and how such products are placed in the competitive landscape.</p> <p>University contribution is also not so likely, since it is a topic mostly in the business domain.</p> <p>A discussion on what type of products is included under the term "hearables". The product term "hearables" was originally coined for a hybrid of the terms wearable and headphone. Focus seems to be mostly for binaural applications:</p> <ul style="list-style-type: none"> • OTC ("over the counter" products) belongs to the category of medical product, i.e. hearing aids. The WG feels that this is a separate domain, and does not fit into the general term "hearables" • Instead, most of the "hearables" seen to date are Bluetooth devices that use phones or PCs as the central computing unit. Focus seems to be on mobile communication, real time information services, activity tracking including biometric data, e.g. temperature, heart rate or oxygen saturation. <p>Although "hearables" is a business domain for many consumer technology manufacturers, several SME's and start-ups also have managed to obtain crowdfunding and soft funding from e.g. EU R&D funding, and are active in the area.</p> <p>Given the difficulty in identifying speakers for the area, we decided to put the theme on hold for now.</p> <p>However, all members of the WG are encouraged to keep an eye on any potential speakers for the area. If successful, we may reopen the theme "hearables" again.</p>
14.a 14.b	Noise cancellation Speech Prediction	<p>Primarily a topic related to headset solutions.</p> <p>The two topic areas should possibly be combined to one webinar, since it could prove difficult to find presenters for two events.</p> <p>Potential speakers:</p> <ul style="list-style-type: none"> • Yurii Iotov, Industrial Ph.D. Student at Jabra (contact Clément Laroche). • Torben Christiansen, EPOS, or colleague of his may be an option. • The automotive industry, ask Gorm Haldor Jørgensen, Harman in Struer. • University people: e.g. professor Simon Duclou, Oldenburg University, Germany, https://hearing4all.de/en/h4a/people/principal-investigators/ <p>Once we have accept from three possible speakers, we call a meeting with the three to discuss how each panelist see his/her focus and how that fits with the others.</p> <p>Pedro will contact the potential speakers and set up a planning meeting.</p>

#	Subject	Background
15	Feedback cancellation/suppression/control	<p>Focus here is feedback cancellation in e.g. PA systems (stage performance), speaker phones, hearing aids (microphone control), etc. (but not headsets)</p> <p>Underlying physical principles are in conflict so interesting to look into how echo cancellation can be bridged with feedback cancellation. A somewhat common denominator may be regulation control.</p> <p>Speakers/themes:</p> <ul style="list-style-type: none"> • Meng Guo, Oticon, (expert) • Acoustic echo control in speaker phones, i.e. rea duplex in speaker phones? (contact Clément Laroche, alternatively Torben Christiansen, EPOS) • Lage concert feedback control (EU Monica project, contact Diego from Jabra) • Efred Fernandez Grande. <p><i>Pedro will contact ad coordinate.</i></p>
16	DSP event	<p>Broad focus on DSP. A lot can be said, but since we already had two DSP event in lae part of October 2022, there is consensus that a DSP theme should not be addressed for the next ½ year.</p> <p><i>Next DSP theme to be postponed until at least mid-2023.</i></p>
17	Use of sound with robotics	<p>The theme was briefly touched on the topic in recent webinar, Robot Audition (April 19, 2022). We should focus on making a joint follow up event with the Robot Cluster, 'Odense Robotics':</p> <p>Contact persons:</p> <ul style="list-style-type: none"> • Søren Elmer, Project Director, Odense Robotics, • Jonas Jorgensen, Assistant professor at SDU Biorobotics (gave a presentation on sound with biorobotics at the recent Digital HiTech Sumitt) • Jens J. Tybo Jensen <p><i>Pedro to contact Søren Elmer and possibly also the other proposed speakers.</i></p>
18	'Sound Quality in Digital Meetings'	<p>The initiative is likely to take a long time to mature. The incentive is to spawn R&D work at universities and GTS institutes.</p> <p>It is important that we obtain more traction on the area. Two-three approaches that we should try next are:</p> <ul style="list-style-type: none"> • Present the topic in the DSC network-group for entrepreneurs and see, if we can stir up some interests in this group. Possibly we should use ½ hour or so in presenting the challenges. • If this approach is successful, we could follow up with a symposium/sound meeting on the topic, or the topic be part of a symposium/sound meeting • At the upcoming calls for projects in January 2023 we could prioritize projects that fall in this category. <p>In general, we should look for people that are likely to consider the area and bring them into our circles.</p> <p>For us it is important to understand better, who we want to support and what the community needs from us I this context.</p> <p>See also attached paper on "Sound Quality in Digital Meetings".</p>

#	Subject	Background
19	AI in Audio Applications	<p>On October 26, 2022, we gave a presentation at the Digital Hi-Tech Summit in Bella Center on "AI in Audio Applications". The event saw some high-quality presentations and we could with a minimum effort repeat the theme and make it available to a larger group than the ones that attended the Digital Hi-Tech Summit.</p> <p>Presentations:</p> <ul style="list-style-type: none"> • <i>"The importance of AI in development of the Danish sound industry"</i>, Birger Schneider, CHAMAJ Consult • <i>"Data driven AI based algorithm for speech enhancement"</i>, Clément Laroche, JABRA • <i>"AI methods for enhanced voice pick-up"</i>, Torben Christiansen, EPOS. • <i>"Present and future applications of AI in hearing aids"</i>, Lars Bramsløw, ERIKSHOLM Research Centre <p>The webinar could be launched already in December 2022. Clément and Torben have already accepted.</p>

Ad 2: Physical Events

Sound Day 2022 will take place on November 9, 2022, at DTU SkyLab, Centrifugevej 374, 2800 Kongens Lyngby.

Event is now sold out.

Ad 3: Collaborative projects

New round of calls for projects are planned for January 2023

Next meeting

The next meeting in the working group on "Future Sound Tech Solutions" will take place:

- **Monday December 12, 2022** **13:00 to 14:00**

Appendix 1: Participants in the meeting

Clément Laroche	GN Audio, Jabra	Senior Research Scientist
Jonas Raun Hansen	GN Hearing A/S	Manager, Electro Acoustics
Morten Kroman	WS Audiology	VP R&D Electronics
Niels Pontoppidan	Eriksholm Research Centre	Research Manager
Birger Schneider	CHAMAJ Consult ApS	Director
Pedro Costa	Danish Sound Cluster	Project Manager
Torben Vilsgaard	Danish Sound Cluster	CEO

Appendix 2: Events proposed and promoted by the working group

#	Title	Comments	Event type	Date
1.a	AI/Machine Learning	Workshop (Edge)	On-line	5 April, 2022
1.c	AI in signal processing		Webinar	
2	"Demant Discovery"	Start-up in dialogue with Demant	Networking event	17 March, 2022
4	Audio & privacy	Part of physical conference	Panel discussion	4 May, 2022
5	Sound Quality in Digital Meetings	<ul style="list-style-type: none"> • Position paper • Conference session 	Conference	4 May, 2022
6	Multisensory Processing		Webinar	7 December 2021
7	Sustainable transformation in Audio Companies	Green footprint in sound	Webinar	25 January, 2022
9	Personalization of User Needs		Webinar	1 June, 2022
10	Data Simulation for AI		Webinar	7 June, 2022
11	Perceptual Audio Evaluation		Webinar	13 October, 2021
12	Key Note, Sound Day 2021 "The Sound of Metal"	Oscar Winning Mikkel E.G: Nielsen, Film editor & Nicolas Becker, Sound Designer	Conference, Sound Day 2021	17 November, 2021
	AI in Audio Applications	Conference event at Digital Hi-Tech Summit, Bella Center	Conference	26 October, 2022