

Working Group "Healthcare & Welfare" – Meeting 18

Summary of Meeting #18, June 18, 2024

Agenda

1. Follow-up to the conference at SDU in Odense, 24 April 2024
2. Webinars & physical events in 2024:
 - a. Follow-up on proposals and ideas from meeting # 16 & #17.
 - b. Suggestions for speakers
 - c. New themes?
3. Collaborative projects.
4. News from the DSC Secretariat
5. A.O.B..

Ad 1: Follow-up to the conference at SDU in Odense, 24. April 2024

Agreed that the conference had been a great success, all in all a fine event. Great turnout, even though it took place outside Greater Copenhagen.

Presentations are sent to the participants in an email from Murielle.

Ad 2: Webinarer & fysiske events i 2024

#	Subject	Background
7.a	Speech analysis, pathology, speech recognition	<p>Follow up on the first webinar on the CoRal Project - Danish Speech Dataset</p> <p>Point of contacts:</p> <ul style="list-style-type: none"> • Dan Saatrup Nielsen, Senior AI Specialist, Alexandra Institute • Martin Carsten Nielsen, Co-Founder at Alvenir Natural Language Processing • Lars Maaløe, Co-Founder & CTO at Corti Adj. Assoc. Professor of Machine Learning <p>For the moment, there is no clear agreement on the time for follow-up. Jeppe will follow up.</p>
12.a	Practical use of sound in the healthcare system	<p>Focus on: ISOBEL project</p> <p>IDA together with Danish Sound Cluster held a physical event on January 15, 2024. Søren H. Nielsen and Kim Rishøj, Sound Focus, Martin Bo Møller and Søren Bech, Bang & Olufsen and Eva Wennerwald, Wavecare took part here. There were about 50 participants for the lecture, which lasted 2 hours.</p> <p>We plan a follow-up event, including involving others as well. Suggestions for others</p> <ul style="list-style-type: none"> • Christian Sejer Pedersen, Mo Zhou, Peter Koch, Jan Østergaard, all AAU <p>Jeppe has not succeeded in getting the activity planned. It has not been possible to get in touch with Martin Bo Møller. The aim is to try to create an event that differs from the presentations of the Isobel project, which have already taken place under the auspices of IDA.</p>
15	Education in DK: 'Hearing care professionals' (HCP)"	<p>Better Hearing Aid Treatment in Denmark - New Developments and Use Scenarios</p> <p>Completed on April 24. Conference held in Odense.</p>

#	Subject	Background
16	Self-test of the need for hearing aids, remote test of hearing disabled, etc.	<p>As a supplement to On-line services, AAU under the BEAR project is currently working on at to produce solutions so that a potential user of hearing aids can sit in their own living room and decide whether there is a need for a hearing aid or not. Among other things. PhD student at Dorte.</p> <p>Suggestions for contributions from:</p> <ul style="list-style-type: none"> • Palle Rye, Ph.D. student with Dorte at AAU, but is late • UAUD project at SDU, Jesper Hvass Schmidt, Teleaudiometry <p>WHO has, among other things, a self-test APP, "hearWHO", which can be downloaded to mobile phones. Its purpose is to achieve early identification of hearing loss with the aim of e.g. to be able to counter that exposed/predisposed persons are exposed to additional influences which intensify hearing loss.</p> <p>Palle Rye's Ph.D. project is not yet nearing completion.</p> <p>The theme has been a bit stuck for some time, and there are uncertainties about whether we can carry out an event. Jeppe will contact Jesper Hvass Schmidt, the UAUD project. Jesper will on another occasion speak about that project at the DTA conference in November 2024, so he may be able to contribute.</p> <p>At the University of Oldenburg, they at one point in time worked with a concept for a virtual hearing clinic. Tobias will contact the university to find out if there is anything that could be included in a webinar. https://hearing4all.de/en/research/main-research-areas/it-based-diagnostics-and-rehabilitation/</p> <p>In another context, WHO has also had some focus on the area, namely Ariane Laplante Levesque, who sits at WHO in Copenhagen, https://www.linkedin.com/in/ariane-laplante-levesque/.</p> <p>At the next meeting, we will decide whether, with these possibilities, we see an opening to be able to put together a webinar.</p>
18.a	Approval of products, e.g. CE marking of products.	<p>Proposed program:</p> <ol style="list-style-type: none"> 1. Søren Storm, Dansk Standard project management-oriented approach to CE approval 2. Kim Boll Jensen, Bolls "How can an SME meet CE requirements, a case example." 3. Jacob Steensen or colleague, FORCE Technologies "Approval of wireless interfaces in products" Jakob Steensen has reported back positively about taking part. Details to be agreed upon. 4. Optional: Søren P. Petersen, ex FORCE Technologies 5. Panel discussion <p>Target group: SME companies. Proposal to also send out invitations through e.g. DTU's mentoring program (Deep Tech mentoring) to get many SME companies and start-ups talking.</p> <p>Still under development.</p>

#	Subject	Background
18.c	Approval of products that require medical approval.	<p>Medical approval of products is a challenge, not least for start-ups and SMEs. Approval to eg. FDA in the USA and European requirements, including DS/EN/ISO 13485, and where to start?</p> <p>Large companies in the area, not least the hearing aid companies, deal with the challenge as an integral part of their general quality organization. They have the experience of how to attack approval in the individual markets. For an SME, the challenge is often great, because they lack experience and do not have a quality organization that supports this.</p> <p>A webinar could focus on:</p> <ul style="list-style-type: none"> • Oticon's regulatory team is willing to contribute 30 - 60-minute submissions on the challenge. Thomas Krohn, Principal Compliance Specialist, tkro@demant.com • Can GN-Hearing and/or WSAudiology contribute? (Birger has send mails to WG members from the two companies, Jesper Bolt will check in his organization) • SME: Ausculpto start-up, Aalborg, Oliver Damsgaard, Research assistant, Biomedical Engineering, Aalborg University Hospital (Intelligent monitoring of arteriovenous fistulas in hemodialysis patients) Birger has been in contact with Samuel Erik Schmidt at Ausculpto. He recommends that we instead contact his colleague Claus Bo Vöge Christensen, who has more experience in the process of approval og medical products. • Ernst-Ulrik Haxthausen, Adix, SME experience <p>Once a team has been set up, we plan to set up a planning meeting, where we can coordinate the focus of the individual contributors.</p>

#	Subject	Background
20	Access to data from the hearing care service	<p>Researchers' access to hearing care data.</p> <p>Discussion:</p> <p>Challenges with data ownership have not been clarified, in addition there are requirements around GDPR, validity of data, etc. Danish legislation in the area is restrictive in an international context and makes it difficult to share data. There is also consideration that results must be unbiased, so that you can e.g. do not give trial participants access to their own previous answers in questionnaire surveys, as this will influence answers, etc.</p> <p>With regard to the interconnection of data, there is a development underway in e.g. the project "InHear", which runs at Aalborg University Hospital, and where Lene Dahl Siggaard, lene.dahl@m.dk, phone: 24 76 68 44, will defend her Ph.D. in 2024. in the area, Supervisors are:</p> <ul style="list-style-type: none"> • Morten Høgsbro, MD, Ph.d., M.Sc., senior physician, clinical lecturer • Henrik Jacobsen, MD, mMBA, chief physician • Dan Dupont Hougaard, MD, senior physician, clinical associate professor • Søren Jakobsen, Sundhedsstyrelsen <p>To get an update on the status, the Danish Health Data Agency should be contacted, as they are behind "InHear".</p> <p>https://www.inhear.dk/</p> <p>https://sundhedsdatastyrelsen.dk/da/strategier-og-projekter/hoereomraadet/ny_model_digital_visitation/inhear</p> <p>Jeppe has been in contact with Henrik Jacobsen and Søren Jacobsen, but they have declined due to other working activities. Contact to Lene Dahl Siggaard has not yet been successful. Lene Siggaard is a doctor (doing a PhD in the field) and not a technician in the field, so there is little doubt whether she covers the more technical aspects, which are high on our interest profile. Therefore, it would only be interesting if Jeppe could persuade Søren Jacobsen and/or Henrik Jacobsen to participate, even if they were initially unable to participate. If necessary, we can postpone the event until the beginning of 2025.</p> <p>OEHR (Open Electronic Health Record) is a platform for health data. Used in several areas with success. https://openehr.org/</p> <p>Can we possibly use this platform to move forward with the subject?</p> <p>Through his involvement in an EU company related to audiology, Tobias may be able to make contact with some international people who work on the subject. Lars has also come across the same topic at a recent audiology conference. Lars will try through his notes to identify people that we should contact. Both Tobias and Lars will try to find more relevant information at the next meeting</p>
21	Music in relation to dementia New subject	<p>Projects underway or recently completed under DSC focus on the use of music in dementia.</p> <p>There is great interest in the subject, although research in the area still seems weak. Dementia seems to be closely related to loss of hearing. Hearing aid companies claim this and are supported on such views by US clinical studies.</p> <p>Jeppe has been collecting more information on the subject. Have been in contact with Jesper Hvass Schmidt and Manuella Lech Cantuaria, both SDU have produced a publication "Hearing loss increases the risk of becoming demented". They would like to participate in an event. Søren Riis from Cochlear, who also likes to participate.</p> <p>A date of October 9, 2024 has been set for a webinar entitled "Hearing loss and dementia".</p> <p>The original topic "Music in relation to dementia" is still at a very early stage of planning. Jeppe has been in contact with the conservatory in Aarhus. Here you are working on a project about music in intensive care units, but you are still quite early in the project. We take up topics when there is more information and try to find others who can also contribute.</p>

#	Subject	Background
22	Practical use of AI in industry	<p>In practical use of AI in the audio industry, e.g. in connection with hearing aids, we are faced with the fact that AI offers some possibilities, but an understanding of classic signal processing is also essential. There are examples of a company (now acquired by META) which has offered an AI module that could be used in connection with hearing aids, but where the integration in practice proved largely impossible.</p> <p>It is not necessarily the same people, who have an AI understanding, who can implement the solution, as it requires classical signal processing understanding. We are up against the fact that there are fewer and fewer young people who want an education in signal processing, but who instead focus on AI. But AI by itself does not solve many problems.</p> <p>How do we get the students to understand that there is a need for something else and more, or should the entire part of their education actually take place in the companies after graduating from university?</p> <p>A webinar could focus on:</p> <ol style="list-style-type: none"> 1. Presentation by an industrialist on the issue (Søren will try to find a lecturer). 2. Post from a person with a good understanding of the situation at universities. It is pointed out e.g. at Jesper Jensen, AAU and Demant. Søren contacts him. <p>We want to strengthen the food chain of good engineers for the area supplemented with existing ways of handling the challenge with AI</p> <p>See also Appendix. "AI and DSP development in hearing aids"</p>
23	Speech Analysis and Mental Health Detection	<p>The subject focuses on research within speech that defines the degree of depression. Jens Nedergaard from DSC has been in contact with a researcher at the University of Lund, Sweden on the subject.</p> <p>It is a bit of a continuation of an earlier event in the area.</p>

Next Meeting

- **Tuesday September 24, 2024, 14:00-15:00**

Appendix 1: Attendees in the meeting on June 18, 2024

Jesper Bünsow Boldt	GN Hearing A/S	Sr. Manage Research
Lars Bramsløw	Eriksholm research Centre	Senior Scientist
Søren Pyndt Jørgensen	Oticon A/S	Principal Platform Architect
Tobias Neher	SDU, Sundhedsvidenskabelig Fakultet, Klinisk Institut	Professor
Birger Schneider	CHAMAJ Consult	Director
Jeppe Lindegaard	Danish Sound Cluster	Program Manager

Appendix 2: List of potential themes

Addressed or proposed in previous meetings but for now put on list of potential topics. Waiting for the topics to be better matured – or the need better identified.

#	Subject	Background	Proposers
11	APP and software	Target group: young people with an interest in sound.	Birger Schneider
12.c	Music therapy	<p>Therapeutic approach to the use of music. Relationship between music therapist and client, the use of music.</p> <ol style="list-style-type: none"> 1. Professor Hanne Mette Ridder, AAU (music therapy, among other things in connection with dementia)? 2. Artists who use music in therapy as a kind of "music medicine", rather than actual therapy (where there is a relationship between therapist and client), e.g. Niels Eje and Inge Mulvad Eje (CD series "Musicure") <p>Kira will consider proposals for concretization.</p>	Dorthe Hammershøj Kira Vibe Jespersen

Appendix 3: Events proposed and developed by the Working Group

Topics that the Working Group has initiated, or indirectly helped to initiate.

#	Title	Comments	Event type	Date
8 & 9	The new Bluetooth LE Audio standard		Webinar	22 June 2021
1	Make listening safe		Webinar	6 October, 2021
10	Online-tjenester til høre-rehabilitering mm.		Webinar	18 January 2022
12.b	Noise and its Effect on our Health”		Webinar	7 April 2022
13	Music interventions in HealthCare	Based upon DSC project updating older ”White paper” in the area	Webinar	14 September 2022
7.b.	Speaker Separation		Webinar	23 November 2022
14	” Assessing Real-life User Experience to Improve Hearing Technology”		Webinar	31 January 2023
14	“Sensors, Methods and Tools for Ecological Momentary Assessment”		Webinar	9 February 2023
	”Hearing restauration”		Webinar	19 April 2023
	Hearing aid speech enhancement processing with ML and AI		Webinar	5September 2023

Appendix 4: “AI and DSP development in hearing aids”.

AI and machine learning methodologies are finding their way into hearing aid signal processing. This brings new opportunities for solving key signal processing problems, such as speech enhancement, but also new ways of working as DSP engineer. The "classical" analytical math-based approach to efficient embedded signal processing is replaced by empirical design of neural network topologies, advanced ways of training the networks, and not least, obtaining representative training material.

The AI-approach to solving DSP problems leads to different work patterns and a different set of technical tools, as well as a different mindset to problem solving for the engineers. The reduced application of classical signal processing technique risks leading to a loss of understanding of the underlying physical problem and may in the long run lead to suboptimal solutions.

The aim of a webinar on this topic could be to shed light on the intersection and overlap between classical DSP and machine learning approaches to problem solving. As a case, the state-of-the-art use of machine learning for speech enhancement in hearing aids could be demonstrated, followed by a discussion of how to continue progressing the technological innovation by bringing together the two worlds of classical signal processing and machine learning. There is a need for engineers with the technical competencies to understand the underlying problems analytically, as well as the engineers that understand how to make optimal use of the machine learning techniques to solve the problem in a practical solution.

Søren Pyndt Jørgensen