Working Group ”Healthcare & Welfare” – Meeting 21

Summary of Meeting #21, February 19, 2025

Agenda

1. New focus on SME projects
2. Webinars & physical events in 2025:
    a. Follow-up on proposals and ideas from meeting # 20.
    b. Suggestions for speakers
    c. New themes?
3. Collaborative projects.
4. News from the DSC Secretariat
5. A.O.B.

Ad 1: Focus on SME projects

Birger explained some of the new guidelines that the sound cluster will be faced with in the upcoming 4-year grant. There will be greater focus on involving SME companies in project collaboration, and there will be financial support of around DKK 70,000 for each of the SME partners in a project collaboration. There must be at least 2 SME companies involved in a project. Large companies can also participate but cannot obtain financial support.

At the same time, DSC wants to achieve a strategic focus on the projects that are distributed.

DSC will soon present the future guidelines for project collaboration but is also awaiting feedback on the renewal of DSC's participation in the cluster program. This is expected to be clear by mid-May 2025

Ad 2: Webinarer & fysiske events i 2025

#	Subject	Background
7.a	**Speech analysis, pathology, speech recognition**	**Follow up on the first webinar on the CoRal Project - Danish Speech Dataset** **Point of contacts:** • ***Dan Saattrup 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 Follow-up Webinar will be held on May 28, 2025 Is now advertised on the DSC Web.
12.a	**Practical use of sound in the healthcare system**	Focus on: **ISOBEL project** 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. We plan a follow-up event, including involving others as well. Suggestions for others • Christian Sejer Pedersen, Mo Zhou, Peter Koch, Jan Østergaard, all AAU It is difficult to find an angle to renew the focus of the project findings. Theme will be dropped.

#	Subject	Background
16.a	Self-test of the need for hearing aids, remote test of hearing disabled, etc.	Tittle (proposed): ***Digital solutions for improved efficiency in hearing rehabilitation*** The working group sees two important topics in the area, namely: 1. Remote diagnostics & patient safety 2. Trends in the OTC market, especially after Apple's emergence of new earbuds, which have been approved by the FDA for medical use Both topics are very important and something the group agrees the DSC needs to address. The first is specifically aimed at a professional market for testing, the second is a subject of expected market focus. We choose to go after two subjects, so subject area '2. Trends in the OTC market' transferred to a new topic 16.b In the topic '**Remote diagnostics,'** the following could perhaps contribute: • Professor Jesper Hvass Schmidt¸ Faculty of Health Sciences, Clinical Department - UAUD project, SDU (has activities in remote testing of hearing disabled people) • Dr. Lena Schell-Majoor, The German system may not quite be up to the digitalization level of the Danish. Their aim seems to online test in conjunction with a virtual hearing care clinic approach. ***Proposal for presentations*** *Research based activities* 1. Evaluation of different interfaces for conducting the Matrix Sentence Test on a Smartphone 2. Non-supervised smartphone based measurements of hearing thresholds and loudness perception 3. Measuring speech recognition thresholds using individual, uncalibrated hardware 4. Adaptation of audiological measurement procedures for remote diagnostics • Lene Sigsgaard, AAU University Hospital. (Focus: Digital visitation. A rather practical approach to remote testing. Clinical focus Henrik Jacobsen I s back at AAU and may be helpful in the event. Jeppe will contact Lene Sigsgaard/Henrik Jacobsen again and Dorte may assist by taking personal contacts to Lene. If the topic fails to mature, we may consider some alternatives proposed bb Dorte. Moderator: **Tobias Neher** Tobias is concerned that we need to provide feedback to potential speakers, since they offered their assistance quite some time ago, and not much has happened on our side since. We should contact Lena Scheel-Majoor and Jesper Hvass Schmidt.

#	Subject	Background
16.b	Trends in the market to OTC (Over the Counter hearables) **New theme**	After initial hype, the OTC market, and to some extend larger companies that bet on the market, have languished. However, several start-ups seem to have surfaced, especially in the USA although no convincing markets exist today. A relatively large variation in prices for OTC products exists. Some are relatively expensive, often from larger companies, but also low-cost products have reached the market. Price differences are frequently coupled with quality differences. Apple's new introduction of earbuds to help the hearing impaired may contribute to revitalizing the market. Apple's product, i.e. its software support, has obtained FDA approval for medical use. • Boundary conditions for OTC in the US? • Status in EU in the legislative area for OTC? • Envisaged OTC market? Many people with speech-in-noise hearing difficulties, but who do not have real hearing loss and therefore are not eligible for hearing aid support, may use airpods for support in noisy situations in the coming years. Airpods are already commonly used by many today. There are software solutions available online to support setting up airpods so that they meet personal preferences. Through such psychoacoustic tests, one can set up solutions, perhaps not quite as optimal as professional hearing aids. But if those solutions meet the users' needs, also financially, it may be difficult later, when hearing loss becomes an actual reality, to get people to switch to professional solutions. **Important:** Personal settings may impact hearing, and even people with hearing loss may damage their hearing further. How will it affect the market for, for example, hearing aids if people are already used to using airpods to help with their hearing difficulties? This and other problems may affect the market for hearing aids. We should not focus on getting the manufacturers of hearing-aids to participate, as the topic is too close to their business, but people in these companies too, if they can contribute with market knowledge. People who might be interesting for us to include or ask for references: • Joe Beilin • Andrew Sabin, He is currently employed by Bose Corp. • Mark Lavrens • Alex Ignatius Costa, Director & Head of BrainWorks @ GN Group • Søren Vase Legarth, SenseLab. • Nikolai Bisgaard (may report on European legislations efforts) • Jan Abildgaard, Lizn ApS • Dorte Hammershøj. AAU **Event:** Many short technical inputs & a panel debate. Important to get people who know the current development in the market to give their assessments and then follow up with a panel discussion among people with insight into the market. **Interesting info** (provided by Lars): • https://youtu.be/iZMpkiU0Ipg Acceptability of Apple AirPods Pro by People with Hearing-in-noise Problems • https://www.nal.gov.au/projects/acceptability-of-apple-airpods-pro-by-people-with-hearing-in-noise-problems/ Topic postponed.

#	Subject	Background
18.a	Approval of products, e.g. CE marking of products.	Proposed program: 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." Not yet commitment 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. Panel discussion Target group: SME companies. Proposal to also send out invitations through e.g. DTU's mentoring program (Deep Tech monitoring) to get many SME companies and start-ups talking. **Still under development.**
18.c	Approval of products that require medical approval. **New subject**	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? 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. A webinar could focus on: • 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) • Ernst-Ulrik Haxthausen, Adix SME experience 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. **Not addressed at the meeting**

#	Subject	Background
20	Access to data from the hearing care service	Researchers' access to hearing care data. **Discussion:** 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. 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: • Morten Høgsbro, MD, Ph.d., M.Sc., senior physician, clinical lecturer • Henrik Jacobsen, MD, mMBA, chief physician • Dan Dupont Houggaard, MD, senior physician, clinical associate professor To get an update on the status, the Danish Health Data Agency should be contacted, as they are behind "InHear". https://www.inhear.dk/ https://sundhedsdatastyrelsen.dk/da/strategier-og-projekter/hoereomraadet/ny_model_digital_visitation/inhear • Søren Jakobsen 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 Sigsgaard 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. OEHR (Open Electronic Health Record) is a platform for health data. Used in several areas with success. https://openehr.org/ Can we possibly use this platform to move forward with the subject? 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. Not addressed at the meeting

#	Subject	Background
21	Music in relation to dementia **New subject**	The topic is of interest in connection with the healthcare sector, e.g. nursing homes and the hospital sector. These are sectors that we do not have a strong connection to today, but that does not make the topic any less interesting in an audio context. Since the focus is on the use of music in connection with improving the quality of life for people with dementia, it is highly relevant to the audio field. There is currently a lot of attention on the topic, but relatively little research, as it is difficult to conduct research with people suffering from dementia. In the Danish Sound Cluster context, there has been a project on the topic with Trade Council UK, Trade Council DK, DK Tech Global, Universal Records. Jeppe will obtain information from colleague Tinne Midtgaard **Who to contact:** • Hanne Mette Ochsner Ridder, Professor at Aalborg University, https://www.linkedin.com/in/hanne-mette-ochsner-ridder-6aa75226b/ • Currently, a PhD project at AU is under execution in the area. Kira finds the project interesting and will research more, before she fully recommends it. • Several start-ups are active in the area – to be identified. Kira will try to identify others and proposals from other WG members are highly appreciated.
22	Practical use of AI in industry	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. It is not necessarily the same people, who have an AI understanding, who can implement the solution, as it requires classical signal processing understanding. Unfortunately, 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. • How to engage students during university study? • Alternatively, should education in the field only happen in companies after graduation? • Søren has been in contact with Jesper Jensen, AAU/Oticon and Lars Bramsløw, Eriksholm on the topic: Proposal for webinar: • Moderator: Thobias May, DTU Presentations: • Peter Asbjørn Leer Bysted, Demant • Phillip Gonzales. Demant Additional options: • Jesper Rindum Jensen, AAU, or Andreas Jonas Fuglsig AAU • Jens Brehm Bagger Nielsen, Head of AI at WS Audiology If possible, the importance of domain knowledge is highly appreciated in presentations since that is known to be an obstacle for many real-world applications. The event could be a webinar, but is certainly also an option for a physical event that DSC can set up Will be discussed more at our next meeting.
23	Speech Analysis and Mental Health Detection	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. It is a bit of a continuation of an earlier event in the area. Not addressed at the meeting

24	Danish sentence test **New subject**	Danish sentence test, clinical version is under preparation. Lars and Abbie are working on the topic. Abbie to define the topic area. Not addressed at the meeting.

Ad 3: Themes for Collaborative SME projects

#	Subject	Background
P1	Project idea: Noise during dental work	Risk of hearing damage from dentists' drills (high-speed drills). New studies seem to confirm the problem that dentists with fast-rotating drills have an excess of hearing damage. One can imagine active earplugs that automatically turn up and down. The noise is apparently airborne. Other reports seem to indicate tinnitus problems in connection with ultrasonic cleaning equipment for plastic fillings. Ultrasonic equipment and controls can also cause hearing damage in other circumstances. Knowledge about how the ears react to ultrasound is thin and not much new knowledge has been reported. The problem with dentists is apparently airborne, not structure-borne through the body. Many other ultrasonic controls may also prove problematic. The limit values for noise above 20 kHz are 5 dB lower, probably based on consideration of the specific problem. For example. Cleaning equipment in hospitals in connection with autoclaves uses an ultrasonic frequency close to 20 kHz. If the frequency is above 20 kHz it is one measurement value, slightly below it is another measurement value. It was mentioned that in the early years of ultrasonic controls for radio/TV there was debate about whether dogs' hearing was damaged by the ultrasound.
P2	Project idea: Too many false positives with camera surveillance on quaysides	Some places, including Aalborg, have installed camera surveillance to detect when people fall into the water, e.g. at night. But seagulls and other things also cause alarms, ‘false positives’. Today, heat-seeking cameras are used. Another challenge, for example, is that a camera cannot see around corners. In a student project (Flemming Christensen, AAU), a cheap transducer has been developed. Using AI, triangulation of sound and comparison with visual data, it will be possible to develop systems that are more robust against 'false positives'. The transducers must be cheap, and the principles must be tested. They are intended to be installed in connection with Tryg-Fonden's rescue ladders. A project where municipalities, Tryg-Fonden, universities and audio companies join forces on a finished product solution could be interesting.
P3	Music in relation to dementia	AU is involved in R&D in the topic area dementia and would like to identify SMEs that take an interest in adopting the R&D results for us in the real-world applications.

Next Meeting

- **Thursday 01 May, 2025, 10:00-11:00**

Appendix 1: Attendees in the meeting on February 19, 2025

Abigail Kressner	DTU, Hearing Systems, Health Technology	Assistant professor
Dorte Hammershøj	AAU	Professor
Kira Vibe Jespersen	AU, 'Music in the Brain'	PhD, MSc
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
12.c	Music therapy	Therapeutic approach to the use of music. Relationship between music therapist and client, the use of music. 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" Kira will consider proposals for concretization.	Dorthe Hammershøj Kira Vibe Jespersen

Appendix 3: Events proposed and developed by the Working Group or in its focal area

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	5 September 2023
	Better Hearing Treatment		Physical vent, Odense	24 April, 2024
	Hearing Loss & Dementia		Webinar	9 October, 2024