



Invitation to the First Danish-Japanese Welfare Technologies Workshop

New Horizons for Telehealth, Telerehabilitation, Welfare Technologies & Programs

June 10-13, 2019 Denmark

JD TeleTech Network

The target groups for the First Annual Danish-Japanese Welfare Technologies Workshop are professionals within healthcare, education, welfare-technology companies and researchers

The aim of the Danish-Japanese Welfare Technologies Workshop is to develop closer collaboration between Denmark and Japan in the development, testing and evaluation of existing and future telehealth, telerehabilitation and welfare technologies and programs. The program will include workshops, seminars and visits to healthcare centers, hospitals, eldercare homes, colleges for training healthcare professionals and a visit to Aalborg University's welfare technologies research laboratory.

Dear Japanese colleagues within healthcare, technology and research

On behalf of the JD TeleTech, we would like to invite you to Aalborg, Denmark for the First Annual Danish-Japanese Workshop on Welfare Technologies: "New Horizons for Telehealth, Telerehabilitation and Welfare Technologies and Programs", to be held in Aalborg, from June 10-13, 2019.

Aims of the workshop are

- To create dialogue and collaboration between Japan and Denmark within telehealth, telerehabilitation, welfare programs and technologies;
- To create the framework for collaboration between Japan and Danish universities, hospitals, municipalities and industry for developing, testing and evaluating telehealth/telerehabilitation and welfare technologies;
- To facilitate the development of new products, methods, and solutions for health-related diagnostic, treatment, and rehabilitation tasks in private/public partnerships between Japan and Denmark;
- To present to our Japanese colleagues the structure and everyday operation of the Danish health system within elderly care, disease management for patients with chronic diseases and social welfare.

Final program will be online

This publication describes the workshop offerings and activities. For more details about the final program, please follow this link:

https://www.jdteletech.com/activities/aal2019summit/

Workshop participation is free of charge. There is no registration fee of any kind. Participants must cover their own travel and lodging expenses. During the workshop there will be free transportation to special activities in the towns of Viborg and Skive.

Registration before May 17, 2019

Registration for workshop activities is mandatory. Please use the above-mentioned link and register before May 17, 2019. The link also provides information about hotel accommodations in Aalborg.

We are looking forward to seeing you in Aalborg.

Best Regards,

Birthe Dinesen

PhD, Professor & Head of the Laboratory for Welfare Technologies - Telehealth & Telerehabilitation, SMI, Department of Health Science and Technology, Aalborg University



&

Cecilie Topp

Research Assistant, Laboratory for Welfare Technologies - Telehealth & Telerehabilitation SMI, Department of Health Science and Technology, Aalborg University

Monday, June 10

Time	Activity
3.00 pm - 5.00 pm	Sightseeing in Aalborg

Aalborg, Denmark's fourth largest city, is on *New York Times* list as the world's eighth most interesting place to visit this year of 2019 – please see <u>https://www.nytimes.com/interactive/2019/travel/places-to-visit.html</u>



Aalborg is world's eighth-most interesting place to visit this year: New York Times



Aalborg's Musikkens Hus during a gymnastice event in 2017. Photo: Henning Bagger / Scanptx 2017

North Jutland's Aalborg, the fourth-largest city in Denmark, is the eighth-most interesting travel destination this year, according to the New York Times.

Tuesday June 11

Time	Activities
8.00 am - 11.30 pm	Workshops for researchers within telehealth-, telerehabilitation and welfare technologies at the Department of Health Science and Technologies, Aalborg University
11.30 pm – 1.00 pm	Welcome & lunch JD TeleTech workshop at Aalborg University
2.00 pm - 5.00 pm	Visit to town of Skive and the Skive Healthcare Center
6.00 pm - 8.30 pm	Dinner for participants at Limfjordens hus in Glyngøre

The Healthcare Center in Skive

The Healthcare Center in Skive offers health services for all citizens from 0 to 100+ years provided by the hospital, the municipality and the general practitioners, all operating from the same place. Among other services, the healthcare center has the following facilities:

- a fertility clinic
- a clinic for neurorehabilitation
- three clinics with outpatient services (heart, lung and diabetes),
- an emergency clinic
- a rehabilitation center
- a nursing clinic
- the municipal dental clinic
- eight general practitioners
- the on-call doctor for the area
- a midwife
- welfare technology
- equipment for X-ray examinations and blood analysis
- a water basin for training
- it is possible for foreign physiotherapists, occupational therapists, nurses and dieticians to be enrolled at the Skive Healthcare Center as exchange students

The Healthcare Center in Skive is visited by 20.000 people every year. The Center is famous for being one of the first and largest Health Care Centers in Denmark. Please see: https://www.skivefolkeblad.dk/artikel/hjertepatienter-fortalte-deres-historie-til-minister-i-sundhedshuset https://www.skivefolkeblad.dk/artikel/hjertepatienter-fortalte-deres-historie-til-minister-i-sundhedshuset



The municipality's services and main areas of focus in the healthcare center

REHABILITATION

- Post operation
- Preventive

CHRONIC DISEASE

- Diabetes
- Cardiovascular heart disease
- Parkinson's disease
- Chronic lung disease

PSYCHIATRY AND MENTAL HEALTH

- Mental disorders
- Stress
- Loneliness
- Anxiety
- Depression

LIFESTYLE-RELATED TREATMENTS

- Smoking
- Obesity
- Alcohol
- Inactivity

HEALTH EDUCATION, REHABILITATION, RECOVERY

How we work:

- Health education
- Recovery and social training for people with mental disorders
- Rehabilitation through exercising
- If needed, people are offered individual guidance or training in their own homes
- We encourage and help form networking groups for people who have received treatment or health services at the Centre
- Special attention is given to the mental health of the people visiting our Centre, because we know that stress, loneliness and anxiety are major social and health problems and affect the success of treatment
- We have a visiting center for welfare technology a laboratory for training visiting citizens and healthcare professionals in welfare technologies







The Healthcare Center in Skive is part of the JD TeleTech Network. Please see: https://www.labwelfaretech.com/jdteletech/

We are part of the Future Patient-research project, where we offer telerehabilitation to patienst with cardiac diseases. Please see: <u>https://www.labwelfaretech.com/fp/</u>

We use telehealth when working with people who need wound care or who have chronic lung disease. Furthermore, we offer workout apps and videos for the citizens in the municipality.

Ideas for cooperation between Japan and Skive Healthcare Center

- Health prevention how can we work with empowerment and use this to support personal choices that are healthy?
- Health education and self-care among citizens with chronic diseases;
- Telemedicine and teleservices within the field of mental health treatment;
- Developing, testing and implementing new technologies for exercising at home;
- Developing, testing and providing new technological products for people with chronic diseases e.g. diabetes and CLD

About Skive Municipality

- There are 48.000 inhabitants in the municipality
- More than 190 km coastline a large part of the municipality consists of the peninsula Salling in the inlet Limfjorden
- Significant focus on renewable energy
- Fresh food products from the local manufacturers



Visit Skive municipality's webpage: https://www.skive.dk/aktivt-liv/rent-liv/

We end the first day with a dinner at Limfjordens Hus in the coastal village of Glyngøre, please see <u>http://www.limfjordenshus.dk/</u>



Wednesday, June 12

Time	Activities
8.00 am – 12.00 pm	Workshops for researchers within telehealth-, telerehabilitation and
	Technologies at the Department of Health Science and
	Technologies, Aaloorg University
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12.00 pm - 1.00 pm	Lunch and plenum (place to be announced)
01.00 pm - 6.00 pm	Visit to Aalborg
	Living Lab
	Nursing home of the future
	Center for Welfare Technologies
	Future Lab at SOSU Nord
6.00 pm - 9.00 pm	JD TeleTech dinner in Aalborg (place to be announced)

Department of Care for the Elderly and Disabled, Municipality of Aalborg

The Department of Care for the Elderly and Disabled works with social and health issues for elderly residents and residents with disabilities. The Department's aim is to enhance the residents' ability to live an in-dependent lifestyle. This is done in cooperation with the residents and their networks. The Department consists of three offices: The Executive office, Elderly and Health and the Disability office. To accommodate the challenges within the elderly sector, the department relies on four main strategies:

To have a **dynamic** organization working with **rehabilitation** and **co-creation** and finding new solutions utilizing **welfare innovation**.



You can learn more about Aalborg in figures at this link: <u>http://www.e-pages.dk/aalborgkommune/2598/html5/</u>

Collaboration between Japan and Aalborg

Many industrial countries are now facing the same kinds of challenges within the elderly sector: a larger number of elderly citizens, greater numbers of people with care needs, citizens with more complex needs, a decrease in the working population, higher demands and expectations from citizens and a fixed budget. These challenges cannot be met by doing more of the same. Alternative solutions are needed. We believe that collaboration between cities and with other countries, like Japan, and with the private companies working with welfare technologies can produce the kind of results that will meet these eldercare challenges. In the Municipality of Aalborg, we have the knowledge and experience in carrying out welfare innovation and organizing and operating homecare, nursing homes and rehabilitation. We invite you to collaborate with us in all areas of welfare innovation and rehabilitation services.



Living Lab

Quality and Innovation Unit

Living Lab was created January 1, 2014, as part of the Nursing Home of the Future in Aalborg. In connection with the establishment of the Quality and Innovation Unit on January 1, 2016, the functions, budget and resources were transferred from Aalborg Municipality. Today the Living Lab works with various ongoing technology projects. The experience gained from the tasks/methods in Living Lab is applied to projects supported through the innovation pool or in cases where the Quality and Innovation Unit is involved as partner in municipal administration. Living Lab is a method of developing, testing and evaluating technologies close to the users. In assessing technologies and projects, Living Lab operates with three 'bottom lines': Citizen, Employee, Organization.

Living Lab also has the role of facilitator in the establishment of innovation /research environments, helping to connect project partners, users/evaluators, project organization/methodology and infrastructure and technology. Living Lab helps streamline the process to produce (technological) products, services, and/ or research / knowledge aimed at welfare innovation in the elderly and disability area. As a project facilitator, Living Lab ensures the most effective coordination, continuity and execution of the process in relation to the established goals, sub-processes and bottom lines of the project partners.

LAB cooperation

Living Lab is a method of developing, testing and evaluating technologies close to those who use them. Living Lab operates with three types of collaboration:

1. LAB collaboration with private companies whose products and services focus on welfare innovation in the areas of elderly and disability care.

2. Living Lab allows companies to interact with users in the real world so that innovation, development and maturation of products, processes and services can be based on the user's

actual needs, wishes and behaviors. Innovators and companies must be able to create evidence and documentation, from initial development to final testing and evaluation. Hence, from start to finish, Living Lab can ensure that the company obtains systematic and knowledge-based innovation, whether it concerns products, processes or services. This systematic approach helps companies strengthen their product development and marketing. Living Lab thus has a strong business promotion perspective. LAB collaborates with university environments and/or knowledge and education institutions. It offers collaboration on practice-oriented or so-called application-oriented research, the purpose of which is to provide professional development, new knowledge and experience in the areas of elder care and disability care, enabling the municipality to meet the changing demands and needs of citizens seeking high quality elder care for themselves or their elderly family members.

Research and development projects carried out under Living Lab's direction can contribute to the continued strengthening of innovation and the ability to adapt to the enhanced demands of the elderly and disability sectors; for example, research results can be rapidly transformed into effective methods of care, and new care practices. can be taught at social and health schools and university colleges. Finally, co-operation between Living Lab and university environments can also help to qualify and develop research efforts in the field of elderly and disability care.

3. Living Lab can contribute/assist in evaluating and implementing recently purchased welfare technology and inserting it into care management systems.

Nursing home of the future

Modern permanent care facilities should ensure that all the key elements are integrated and supplement each other so as to ensure the highest quality of services and welfare for users; these elements include location, architecture, nursing care, assistive technologies and interior design.

The permanent care facility should be carefully designed to enhance care practice, domestic comforts, and provide a broad range of individual



and social activities, so as to stimulate the senses and the mobility of residents, and to give them ample opportunities for togetherness (social inclusion). The architectural design of a permanent care facility should not signal that it is primarily an elderly care facility. The permanent care facility should put the person first; because every elderly person is an individual having a unique past, present, and future; hence, there must be room for differences, also among the old age residents themselves. For this reason, a home and everyday environment must be created that is intimately related to the life story of the resident and his/her way of life.

A permanent care facility should provide an opportunity for social interaction or togetherness; the resident must be able to interact with others, sharing interests, goals and dreams, thus forming social networks and engaging in communities. In a permanent care facility, the resident must have the opportunity to live the life

throughout the house; e.g. by meeting with like-minded people in various theme rooms, joining with others to fitness or in a library.

In other words: In a permanent care facility, the resident should be able to have experiences and activities, because the senses must be stimulated, the body moved, and the brain challenged; life should be lived, all the time. The permanent care facility must provide ample opportunities for experiences and activities, but also for those quieter moments, depending on the resident's needs, desires, and phase of life. This is also the aim of The Nursing Home of the Future in Aalborg. The Nursing Home of the Future has implemented various assistive technologies:

The apartments are equipped with pressure sensitive flooring. The floor will alert the nursing staff if the resident falls. The floor is designed in such a way that residents do not notice it during their daily life. If they get up during the night, the lights switch on automatically. The flush/dry toilets in the apartments make it possible to use the bathroom without assistance, which is one of the services most highly praised by the residents. Furthermore, the apartments have installed ceiling hoists, thereby ensuring safe and effective transfers of the residents.



Electronic information boards in the hallways help keep residents updated with important information. Residents in need of technical assistance can visit the IT café, where employees can provide help with tablets and accessing other important digital information. The Nursing Home of the Future and other nursing homes in Aalborg is a Living Lab, in which new welfare technologies, new workflows as well as new kinds of staff teamwork can be tested, evaluated, and implemented.

For a video of The Nursing Home of the Future, see the link: <u>https://www.youtube.com/watch?v=hglB444kpLA</u>

To download a brochure of The Nursing Home of the Future, go to the link: http://www.fremtidensplejehjem.dk/media/18926/fremtidensplejehjemmindrebrochure.pdf

Nursing Home for persons with dementia - "Tornhoejhaven"

The ambition of Tornhoejhaven is to create a habitat where behavioral disorders are reduced and the residents are supported to manage on their own in the best possible way, so that their quality of life increases. The nursing home has been constructed so that the architecture interacts with the basic challenges of dementia. Attention is paid to the diversity of the residents' conditions, enabling the home to accommodate the entire spectrum of dementia. The resident's quality of life is maximized for each individual resident according to their condition. The nursing home is built as a village, with small individual houses showing a minimal institutional character. The outdoor areas allow for various activities that strengthen the residents' mental and physical health. The outdoor areas also provide sensory effects that bring the residents into contact with memories, as well as allowing residents to keep up with the seasons. The aims for Tornhøjhaven are:

- to create the best possible everyday life for the individual resident in a framework that guides and supports his or her everyday life and can serve as inspiration elsewhere;
- to create peace of mind through domestic frameworks, where there is focus on clarity, recognizability and a simple structure that can help the resident manage their everyday life.

Center for Welfare Technologies

The center is an offer for citizens, employees and other stakeholders, that functions to exhibit and test new welfare technological possibilities. Visitors can experience and try out the latest welfare technologies. Welfare technology solutions can either help make citizens more self-reliant, or they can create a better working environment for those staff working with people with disabilities. The Center's role is to inspire and showcase opportunities for citizens and employees in terms of the latest welfare technology in order to create a greater understanding of welfare technology solutions in practice. The Center for Welfare Technologies is a unit within the Center for Devices and Welfare Technology A/S, a collaboration between Brønderslev, Jammerbugt and Aalborg Municipalities. It is possible for staff or citizens to obtain assistive aids at the Center for Aids, Fåborgvej 15 A, 9220 Aalborg East. Here physical aids are used, recycled, retrieved and delivered if there is no need for them anymore.



Collaboration with Japan

The Center for Welfare Technologies is part of the JD TeleTech. In 2018, we were visited by Professor Tomoko Kamei of St. Luke's International University, Tokyo, and she saw many opportunities for collaboration between Denmark and Japan. We hope to see more visitors from Japan here in Denmark so that we can discuss possibilities of collaboration.

See a video of the Center for Welfare Technologies at this link: <u>https://www.youtube.com/watch?v=Gqd-mP3SSmY&feature=youtu.be</u>

Future Lab at SOSU Nord

About the Knowledge Centre

The Knowledge Centre for Welfare & Assistive Technology West Denmark is operated by SOSU Nord, the Fredericia-Vejle-Horsens Social Welfare & Health Training College and the Funen Social Welfare & Health Training College, and it collaborates with other Social Welfare and Health Training (SOSU) colleges across the country. The purpose of the Knowledge Centre is to prepare students in health, caregiving and pedagogy for the labour market of the future, where welfare technology will play a much greater role. This is done through the use of three focus areas, where we collect and develop knowledge.



Welfare Technology, Simulation and Innovative Learning

The Knowledge Centre disseminates its collected knowledge in order to support all colleges in putting welfare technology, simulation and innovative learning into action in new ways. The goal is to enable welfare staff to realize the potential of new, digital solutions and technologies in synergy with citizens. You can read more about each of the partner colleges:

- SOSU Nord Health College, please see <u>https://sosunord.dk/about-sosu-nord/</u>
- The Basic Health Care College of Fredericia-Vejle-Horsens, please see <u>http://www.sosufvh.dk/international/international</u>
- Social and Health Care College Funen, please see https://sosufyn.dk/information-in-english/

Goals of the Knowledge Centre

Goals of the Knowledge Centre for Welfare & Assistive Technology West Denmark

Support the other professional colleges in their work on the digitization of training courses based on new technologies, and in developing and testing new programs that can be used widely in developing talents. The Knowledge Centre for Welfare & Assistive Technology West Denmark will therefore collaborate at a minimum with all SOSU colleges on Funen and in Jutland. In addition, points of collaboration with the Knowledge Centre for Welfare & Assistive Technology East Denmark will also be secured.

• Help ensure that all students on professional training courses are challenged to become as competent as they can.

- Help to educate students on professional training courses in how to manage technological developments and match their competencies with the profiles being sought by companies on the digital labor market.
- Increase the prestige of professional training programs and thereby attract more resourceful, young students to the courses.
- Make better use of the combined resources and conditions across professional colleges including knowledge sharing and collaboration.

Innovative learning

At the Knowledge Centre for Welfare Technology West Denmark, we work with innovative learning and learning technologies. When we train future employees within health, caregiving and pedagogy, it is important that they are equipped for the future that awaits them on the labour market. This means we need to rethink the way we teach and the tools we use in our teaching. Virtual reality can bring students closer to welfare technology and integrate it into their learning process. Students are physically active in learning



environments where they use themselves as tools. In a few years, our students will be preparing for internships by visiting virtual nursing homes, where they can practice in realistic scenarios and get a taste of all the dilemmas they will come across when working with residents. There are a tremendous number of uses for new technology within welfare, but they all require students to have a solid understanding of technology and insights into how it is used. That is why welfare technology needs to be a central component of a student's training, right from the very beginning. We are working on how to make this happen, and not least on how we can realize the huge potentials that technology holds for the students' professional skills.

Simulation

At the Knowledge Centre for Welfare & Assistive Technology West Denmark, we work with simulation in a way, which includes modern user-oriented welfare technology and modern teaching technology as part of the overall teaching approach. We base our teaching around credible and realistic situations in which the students are able to gain experience by operating the welfare technology they come across in practice.

Simulation is a pedagogic tool that accommodates the many different ways in which students learn. At the same time, simulation also supports professional goals and the students' own personal learning objectives.

By working with simulations, students are able to learn through practical experience and reflection, which enables them to make important connections between theoretical knowledge and practical competencies. Simulation-based training provides a space where mistakes are permissible, and where students can repeat exercises in a safe learning environment.

Simulations are often based on cases which entail realistic issues, thereby offering the opportunity to imitate almost all essential components of a situation taken from real practice, so that it can be experienced in an authentic and credible way. As a result, students will be better equipped to understand and handle challenges when faced with similar situations in their future practice. Simulations consist of three phases:

- **Briefing** preparation of the situation
- Scenario the practical execution of a given situation
- **Debriefing** a review of the situation which offers space for reflection, enabling students to develop their repertoire of actions going forward

Welfare Technology

The Knowledge Centre for Welfare & Assistive Technology West Denmark places focus on collaboration and knowledge sharing when it comes to welfare technology and the competencies demanded by the labour market of the future. Developments within local healthcare are placing renewed demands on employee roles and their duties. Welfare staff need to possess a range of professional competencies and be skilled in the use of digital and technology-based solutions. In addition, they need to take part in relationship development work with citizens by finding the right solutions that give meaning and quality of life to individual patients.By developing good relationships, welfare staff can motivate and support citizens in the implementation of technology play a huge role. By collaborating with companies in the development and implementation of welfare technologies, the Knowledge Centre enables students to both become competent users of the latest welfare technologies and to adopt innovation as a natural part of their work.

This strengthens and develops their competencies when working with welfare technologies in practice, as they possess the necessary knowledge and can approach tasks in a creative way. At the same time, companies also gain input regarding changes, functionality and implementation.



Thursday, June 13

Time	Activities
8.00 am -11.30 pm	Workshops for researchers within telehealth-, telerehabilitation and welfare technologies at SMI, Department of Health Science and Technologies, Aalborg University
11.30 pm- 1.00 pm	Plenum on "next steps" & lunch (meeting place to be announced)
2.00 pm – 5.00 pm	 Visit to Viborg Healthcare Center, Viborg Test- and Development Center for Welfare Technologies Regional Hospital of Viborg
5.00 pm - 6.00 pm	Reception (place to be announced)

Viborg Municipality

With 97,000 citizens, Viborg Municipality is Denmark's 9th largest municipality; in terms of geographical area, however, it is Denmark's second largest municipality. The center of the municipality is Viborg City, with 40,000 citizens, with the remaining population living in smaller towns and in villages.

Viborg Municipality is dedicated to the Danish vision of helping citizens to remain in their own homes as long as possible. It thus seeks to provide the needed care and assistance in order to live up to and support this vision. Further, Viborg Municipality wishes to help its citizens have the freedom and possibility to live as independent a life as possible. Viborg Healthcare Centre, together with Viborg Municipality's focus on independent citizens, has implemented relevant and meaningful welfare technology and telehealth solutions. The Test and Development Centre for Welfare Technologies is the key to ensuring that citizens can have an independent, high quality life in their own home. One example of welfare technology solutions is telehealth, where both the citizen and the staff use video calling as a replacement for an actual visit from a care giver.





Intelligent and prudent use of telehealth frees up time for the care giver and gives the citizen more freedom to pursue their own lives.

Viborg Healthcare Center and Health Satellites

Viborg Healthcare Center offers a range of health services for its clients within health promotion. Viborg Healthcare Center is located centrally in Viborg. Due to the municipality's large geographic area, the five satellite healthcare centers are in local areas, each with their own health-promoting and preventive service offerings, so that clients have the opportunity to utilize the local health service offerings.





Viborg Healthcare center offer:

- Rehabilitation of Viborg Municipality residents suffering from diabetes, cardiovascular disease, COPD, cancer, lumbar back pain, osteoporosis;
- Preventive and health promoting work focusing on diet, smoking, alcohol, exercise and mental health;
- Voluntary patient education, anxiety and depression therapy, chronic pain treatment and courses for family members.

For the visit on June 13, you will have the opportunity to hear more about the various service offerings.

You can read more about the Viborg Healthcare Center on its website, where there is a translation function for English (select the British flag in the menu): <u>https://sundhedscenter.viborg.dk/</u>

Welfare technology in Viborg Municipality

In Viborg Municipality, we work to target the development, testing and implementation of welfare technology that gives value to the clients, the staff and the municipal welfare system.





Viborg Municipality's work with welfare technology must support the core task in the areas of social services, healthcare and care, so that the municipality collaborates with the residents to give them an independent, meaningful and active life – throughout their lives. Against this background, the professional specialties in the municipality work closely together so that we share experiences that can support the residents of all age groups, from the small child to the elderly citizen.

The municipality is seeking to expand the cooperation so that it will also include other sectors. It participates in the partnership with the Test and Development Center for Welfare Technology (TUCV), which consists of the Regional Hospital of Viborg, Business Viborg, Center for Industry and Viborg Municipality. We work with:

- Smarter and efficient workflows, where we use technology to support the staff in delivering quality service to the client with the least possible resource consumption, for example, in situations of care and relocation;
- **To support** the individual citizen in living an independent, meaningful and active life. This can be achieved using apps that create structure and help plan daily life, 'the helpful bed' that can turn the citizen so that he/she can get more easily out of the bed, wash-and-dry toilets, and sensors that alert clients with dementia and their relatives about unexpected behavior.

Training

When clients are supported with training, they obtain a better physical foundation for living an active life. Therefore, in recent years, we have been working with training technologies and telehealth solutions. At training facilities, we have set up the AlterG Anti-gravity Treadmill where one can train in weightless mode;

• The **DigiRehab** digital training program is carried out by the regular helper along with the client in order to raise the daily physical level. The program contains various fun training and activity technologies that provide training and shared experiences with others in an easily accessible manner.

Virtual solutions

Using a screen, citizens receive a 'visit' in their own home at pre-arranged times instead of or as supplement to the physical visits. Many of the



citizens who receive pre-arranged virtual home visits can also phone their regular helper or nurse themselves. Viborg Municipality, together with the supplier Viewcare, has since 2012 developed the virtual home and nursing visit service into an extremely flexible solution where all employees have an app on their tablet enabling them to 'visit' the citizen virtually. The solution can also be used so that the user can invite a resource person for a video meeting. For example, if a social and healthcare assistant needs a more qualified assessment from a nursing professional, she can bring a nurse onto the screen so that they can jointly assess the client and plan the next step.

Test- and Development Center for Welfare Technologies



The Test and Development Center specializes in testing and developing technologies within welfare and health. With Viborg Municipality, Regional Hospital of Viborg and the Center for Industry in Viborg Municipality as dedicated founders, we have access to rapid, effective and flexible testing of products in real-life welfare/healthcare environments.



We focus on 'close to market' tests and early stage innovation processes. As we exist solely to ensure that our founders can obtain quick wins, and because we work within a real-life environment, our testing and development set-up is simple and fast. The screening of products and companies is based on the level of innovation and the main question we pursue is: 'Will this idea or nearly finished product give us a payback in a relatively short period of time?'

For more information about the center, see the website: https://www.tucv.dk/

The Regional Hospital of Viborg

The Regional Hospital in Viborg is the largest hospital in region of Central Jutland, which also includes the regional hospitals in Silkeborg, Skive and Hammel Neurocenter. Before 2011, the Regional Hospital of Viborg entered into a joint cooperative arrangement with the Regional Hospital of Skive. The Viborg Regional Hospital contains approximately 500 beds and employs 2900 staff. The hospital has several departments for specific treatments, including e.g. a neurology department treating spinal cord



injuries. Presently, the clinic is testing a rehabilitation robot named 'Robert', to be used during training with a physical therapist. The function of 'Robert' is to work with patients who have functional impairment/lack of strength by moving their legs. The robot gets instructions from a physiotherapist for conducting the movement and is then able to imitate the physiotherapist's movements in the smallest detail and at the same pace.



'Robert' will not only be used for passive movement therapy. It can also be used during muscle training, fully or partially with support if needed. The patient should also be able to repeat a treatment cycle or switch off the robot using a remote control, enabling the physiotherapist to perform other tasks while doing so. In addition, the robot can vary the speed of the exercises. See link: <u>http://www.hospitalsenhedmidt.dk/regionshospitalet-viborg/</u>

Future Patient – telerehabilitation of Heart Failure Patients



The Future Patient project is a collaborative research project between the Cardiology Departments at the Regional Hospitals in Viborg, Skive, Randers and Silkeborg, healthcare centers in Viborg, Skive, Randers and Silkeborg, the Danish Hear Foundation, Viewcare digital communication and three university research departments: Aalborg University, Aarhus University and the Technical University of Denmark.

Patients with heart failure are the target group of this research project. Telerehabilitation is understood as information from measurements of blood pressure, pulse, step, etc. that are transmitted wirelessly to health professionals from the patient's home via information and communication technologies while patients are in the rehabilitation stage. The Future Patient telerehabilitation program has been developed based upon user-driven innovation. The purposes of the study are:

- To investigate whether patients with heart failure will be better at managing their own illness with the help of new technology;
- To investigate whether multimetric data (blood pressure, pulse, weight, steps, sleep, etc.) and issues related to the development of the patient's condition and psychological well-being can help predict worsening of symptoms and the need to readmit heart failure patients;
- To investigate whether patients with heart failure who use tele-rehabilitation will experience a more personalized rehabilitation program and greater coherence between discharge and rehabilitation;
- To investigate whether patients with heart failure who use telehealth resources will be better able to manage their disease and increase their quality of life.

The Future Patient research project is collaborating with a Japanese company

Through the JD TeleTech, the Future Patient project has begun collaboration with the Japanese company Teijin on development and testing of new technologies for cardiac patients.

You can read about the research project here: https://www.labwelfaretech.com/fp/heartfailure/?lang=en

Laboratory of Welfare Technologies – Telehealth & Telerehabilitation, Department of Health Science and Technology, Aalborg University

The Laboratory for Welfare Technology is part of SMI at the Department of Health Science and Technology at Aalborg University. Our laboratory focuses on developing, testing, implementing, and studying the effects of new welfare technologies and on types of care, treatment and rehabilitation within telehealth and telerehabilitation as used with patients and citizens in the social and health services of tomorrow. The research, which is problem-oriented and multi-disciplinary, is carried out in collaboration with researchers from several disciplines: medicine, psychology, physiotherapy, occupational therapy, social service education, nursing, organizational sociology, health technology, computer science, and health economics, both at Aalborg University and at other universities in Denmark and abroad.

User-driven innovation as a starting point

User-driven innovation is the point of departure for our research. We work in dialogue with citizens, patients, their families, health professionals, social service workers, companies and researchers in order to develop the most effective new technologies as well as testing, assessment, adaptation and implementation of these technologies.

Primary research areas

- Innovation of prototypes and 'proof of concept' of new tailor-made, intelligent and cost-effective welfare technologies and applications within telehealth and tele-rehabilitation in the health and social sectors;
- New tools, methods and technologies for motivating citizens and patients to monitor and manage their own illness, health and well-being;
- Innovation and clinical trials of new tele-health and tele-rehabilitation technologies and applications across sectors on a large scale.

Current research projects

- Future Patient telerehabilitation of heart failure patients;
- Digital toolbox for cardiac patients development of algorithms for cardiac patients to manage their disease;
- Gamification and telerehabilitation of cardiac patients;
- iTrain- telerehabilitation of COPD patients;
- Orihime test of social robot within social psychiatry;
- The Videoassist tele-psychiatry.



You can read about the Laboratory for Welfare Technologies research projects at this link: <u>https://www.labwelfaretech.com/?lang=en</u>

Networks technology and service platform group – communication technology section, Technical University of Denmark (DTU)

The networks technology and service platform groups do research and education in various areas of physical networks and future internet solutions with a focus on the support for applications in the areas of health technology, transport systems (trains, cars, aircraft), financial sector, etc.



The group has extensive experience and expertise in experimental validation and simulation of very complex communication architecture and in documenting reliability, availability and service quality.

The research approach used is holistic and incorporates end-to-end solutions with a focus on all aspects, from users and devices to backend systems realized in flexible and softwaredefined datacenter structure (Cloud, Fog, Edge).



The research makes extensive use of statistics, probability theory and machine learning for optimization analysis and scalability prediction – in combination with state-of-the-art simulation/emulation tools and approaches.

The research group has extensive experience from various national and EUfunded research projects on ICT structure design and has had active collaboration with both service and network providers. A special focus is on future IoT systems (M2M, IIoT etc.), where ultra-low latency and high availability (five-tosix 9 networks) is required, either as slices in a 5G infrastructure or dedicated infrastructures (physical or virtualized). Another focus is on secure and reliable data management, that is used either as part of the application or for performance optimization.



Projects in eHealth and Data Management:

Patient at Home (generic ICT solutions for healthcare in private home), TIIMO (intelligent real-time support for children with ADHD), IoT4Life (ultra-reliable and low latency IoT platform for eHealth), COSIGN (Ultra scalable multitenant Datacenter

solutions).





Please see link:

https://www.dtu.dk/english/service/phonebook/person?id=5643&tab=3&qt=dtuprojectquery#tabs

JD TeleTech Network

- you are welcome to join us



Aims

- To increase the quality of life of patients/citizens with a chronic disease using new technologies;
- To ease the workflows of healthcare professionals in the work and collaboration with patients/citizens with a chronic disease;
- To collaborate on developing, testing and evaluating new telehealth/telerehabilitation and welfare technologies between universities, hospitals, municipalities and industry in Japan and Denmark;
- To facilitate the development of new products, methods and solutions for diagnostic, treatment, and rehabilitation purposes in private/public partnerships between Japan and Denmark.

Organization of the JD TeleTech Network

Research Group: Researchers within telehealth/ telerehabilitation and welfare technologies in Japan and Denmark representing research disciplines within the fields of medicine, nursing, computer science, health informatics and social sciences.

Healthcare Group: Japanese and Danish organizations working within testing, implementation, evaluation and innovation of telehealth/telerehabilitation and welfare technologies as well as organizations working with education of healthcare professionals.

Industrial Group: Danish and Japanese companies within telehealth/telerehabilitation and welfare technologies will be invited to be part of upcoming research and innovation projects within new technologies, as well as being invited to participate workshops, seminars, workshops, etc.

Research Group

Japanese Research Partners

- St. Luke's International University, Tokyo
- Social Science ICT Research Center, University of Tokyo
- Department of Neurology, Juntendo University
- Juntendo University Hospital
- Tokyo Women's Medical University
- Japanese Red Cross Toyota College of Nursing

Danish Research Partners

- Technical University of Denmark, Lyngby-Copenhagen
- Department of Endocrinology, Aalborg University Hospital
- Steno Diabetes Center North Jutland, Aalborg
- Laboratory of Welfare Technologies Telehealth & Telerehabilitation, Department of Health Science and Technologies, Aalborg University

Health Group

- Center for Welfare Technologies, Aalborg
- Knowledge Center for Welfare Technologies, SOSU North, Aalborg
- Skive Healthcare Center
- Viborg Test & and Implementation Center of Welfare Technologies (Viborg Hospital and Municipality)
- Department of Elderly Care, Aalborg Municipality

Industry group

- Ory Lab, Tokyo,
- HicS Nordic, Sapporo & Aalborg
- Teijin, Tokyo,
- Telecall, Middelfart

All Japanese and Danish companies are welcome to participate.

Scientific focus

The research focus is on how to develop individualized innovative telehealth/telerehabilitation, and on the welfare technologies and health services that can lead to scalable and sustainable solutions. The research is interdisciplinary (medical, technological, nursing, organizational, economic) and focuses on developing new preventive care and treatment methods for patients with a chronic disease by having them remain in their own home while utilizing innovative digital technologies to maintain contact with healthcare providers. User-driven innovation is the key issue in the international and interdisciplinary JD-TeleTech. Telehealth or telerehabilitation technologies are defined as technologies that use information and communication technologies to transmit data from the patient's home to a healthcare professional. Welfare technologies are defined as technologies for assisted living. In the JD TeleTech, we focus on the next generation of technologies for self-management of chronic diseases based on wearables, Internet of Things (IoT), sensor technologies, VR, gamification, etc. These technologies provide data in large numbers. Hence, part of the research will also focus on data mining and designing algorithms for patients and healthcare professionals. Data security will be part of the research as well.

For further information please contact

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About Aalborg University

- AAU IS an international top-class university. According to US News World Ranking, Aalborg University ranks as no. 260 in the overall world university rankings and as no. 4 in the world, and best in Europe, within the field of Engineering.
- The problem-based learning (PBL) pedagogical model of the University has become both nationally and internationally recognized by universities, researchers and students as an advanced and efficient learning model. Thus, UNESCO has placed its only Danish Chair in PBL at



Aalborg University. AAU will continue to develop and adapt the Aalborg PBL Model to meet the societal and educational demands and changes. This learning model provides AAU students with the possibility of:

- o acquiring knowledge and skills independently and at a high academic level
- o working analytically and according to interdisciplinary and problem and result oriented methods
- o cooperating with the business community on the solution of authentic professional problems
- developing their abilities within teamwork
- o becoming well prepared for the labour market
- Research conducted at Department of Health Science and Technology (HST) takes a mutual starting point; the human body. Our research spans "from molecule to society" covering aspects from the human cell and the molecules it is built from to the full human body.
- The laboratories of Department of Health Science and Technology are equipped to support state-of-the-art research and teaching. The physical dimensions of objects in the laboratories span from micrometers (the cell) to several meters (human run).
- HST'S research cover:

Biomarkers • Biomechanics and motor control systems • Biomedicine and human biotechnology • Cardiology • Decision support • Image analysis • Medical decision support systems • Medical informatics systems • Medicine • Neurology • Pharma technology • Pre-clinical research • Public health • Rehabilitation technology and test of new equipment • Sports science • Telemedicine • Translational neuroscience • Translational pain research and drug profiling • Welfare technology

• At Department Science and Technology, we aim to produce and perform research-based innovation and teaching. Dissemination of our knowledge is prioritized, and we always strive towards establishing dialogue with industry and other potential beneficiaries – our surrounding society, our citizens.

Learn about AAU at https://www.en.aau.dk/

Learn about HST at https://www.hst.aau.dk/

Learn more about Laboratory of Welfare Technologies – Telehealth & Telerehabilitation, Department of Health Science and Technologies, Aalborg University at https://www.labwelfaretech.com/?lang=en