



Appointment of

Professor & Associate Professor in Advanced Ultrasound Imaging

October 2022



AMERICAS ASIA PACIFIC EMEA

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Technical University of Denmark

Technical University of Denmark (DTU) is recognised internationally as a leading university in the technical and natural sciences. We are renowned for our business-oriented approach, our focus on sustainability, and our amazing study environment. With our international elite research and study programmes, we are helping to create a better world and solve the global challenges outlined in the United Nation's 17 Sustainable Development Goals.

Hans Christian Ørsted founded DTU in 1829 with a clear mission to develop and create value using science and engineering to benefit society. That mission lives on today. DTU has 13,400 students and 5,800 employees. We work in an international atmosphere and have an inclusive, evolving, and informal working environment. DTU has campuses in all parts of Denmark and in Greenland, and we collaborate with the best universities around the world.

The main campus is in Kongens Lyngby, north of Copenhagen. The university has 2,200 researchers and 1,300 PhD fellows based across 22 departments and

centres, promoting world-leading fields of research with strong relevance to society, business, and sustainability. Having an international focus is of vital importance to DTU. The university has close to 1,000 international students on its MSc Eng programmes, half of the PhD students are recruited from abroad, and more than one-third of scientific staff are highly qualified researchers of international backgrounds. In addition, the extent and intensity of the collaborations with other leading technical universities around the world continues to grow.

DTU is one of the foremost technical universities in Europe, ranked number one in the Nordic Region (World University Research Rankings) and 103rd globally (QS World University rankings 2021).

DTU has international educational exchange programmes with over 200 universities around the globe and enjoys close research collaborations with partners, in addition to building research and educational programmes with the Nordic Five Tech Alliance, the Euro Tech Universities Alliance, KAIST in South Korea, the Sino-Danish Center in Beijing, and Nanyang in Singapore.

Technical University of Denmark



DTU's Vision

DTU is one of Europe's five leading technical universities, offering Europe's best engineering education.

DTU is internationally renowned for its elite polytechnic research and the education of outstanding and innovative engineers who are a driving force for digital and sustainable change in a globalised world.

DTU develops value-adding technology for people, exploiting synergies between research, education, innovation, and scientific advice, in close collaboration with the outside world.

Further information can be found at [About DTU](#).

DTU's Mission

DTU develops and creates value through the technical and natural sciences for the benefit of society.





DTU Strategy 2020–2025

Strategic Aim

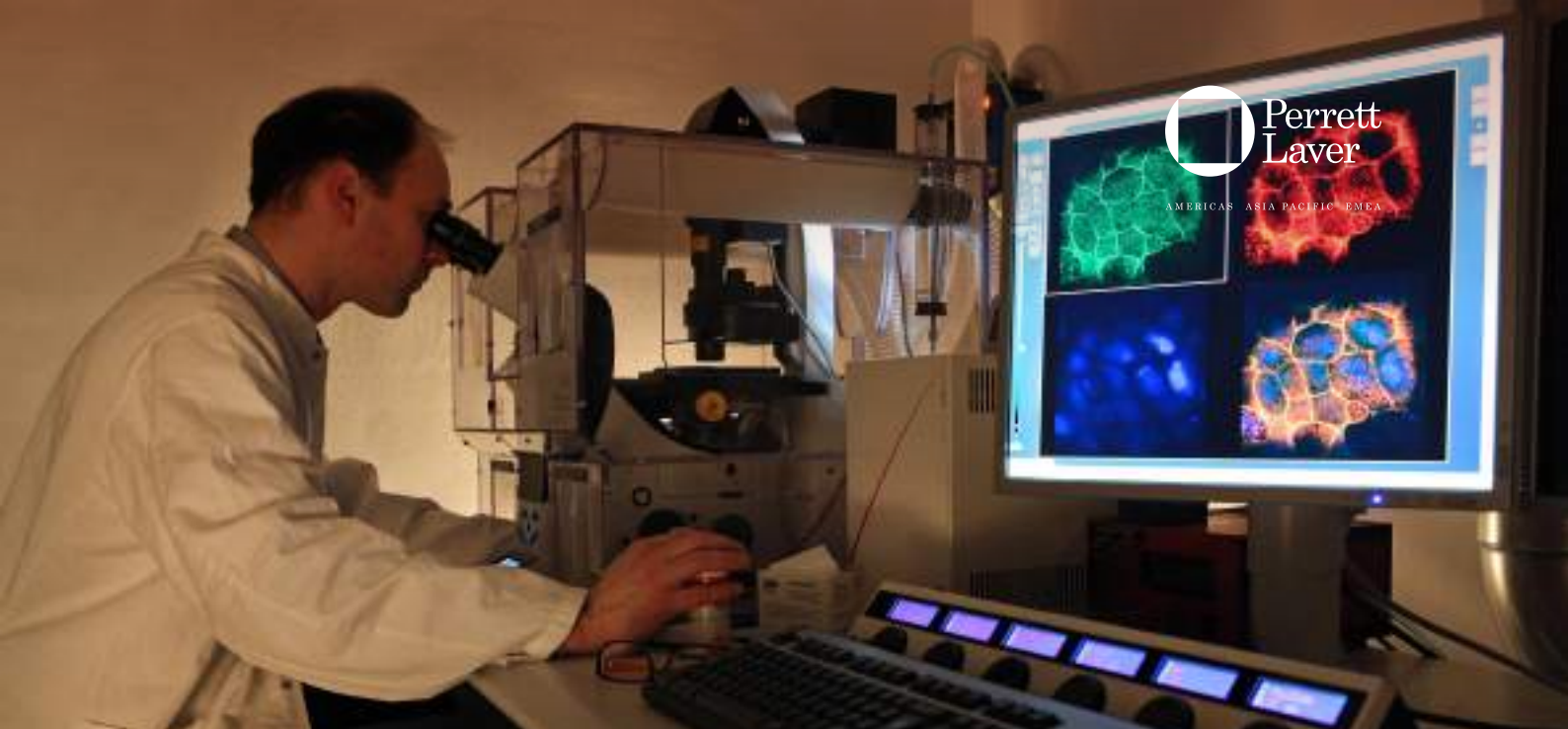
DTU is an elite, innovative university with a global orientation and unique facilities. We support outstanding education and research and take responsibility for knowledge and evidence-based society, with a commitment to sustainable development. The strategy for 2020–2025 continues our deep engagement in research, education, innovation, and scientific advice, building on the successes of previous strategic plans.

We offer consultancy, advice, and partnerships to the business community and government, who prefer DTU's collaborative and innovative approach. We seek new, creative, and world-class partnerships with Danish and international researchers. In the quest for innovative solutions to societal challenges, we collaborate across academic disciplines. We promote a welcoming and collaborative educational and working culture, accommodating all with the requisite ability and drive.

Our values are innovative thinking, credibility, and commitment. These values promote an organisational culture of trust and respect, which ensures a productive study and workplace. We lead the university through an active and engaging organisational dialogue among students and employees, between disciplinary areas, and at all levels of management. This makes us an exemplary, effective, and inclusive university, facilitating an innovative mindset where people work together.

Building on the ongoing and long-term development of our research, education, innovation, and scientific advice, DTU has three strategic objectives in the period 2020–2025: developing Europe's best engineering education, promoting technologies for sustainable change, and realising the potential of digitalisation.

Further information on these strategic aims can be found in the **DTU Strategy 2020–2025, 'Technology for people'**.



DTU Health Tech: Department of Health Technology

We develop health technology that makes life better for people.

DTU Health Tech educates the engineers of the future and develops new technology and solutions with a vision to improve people's life before, during and after they are patients.

We do this in close collaboration with the health sector, industry, academia, and other health partners, because we believe that the best results and ideas often occur in a close collaboration between different sectors.

DTU Health Tech is organised into Research Sections that each contains a number of Research Groups.

- Bioinformatics
- Biomimetics
- Biotherapeutic Engineering and Drug Targeting
- Digital Health
- Drug delivery and Sensing - IDUN
- Experimental & Translational Immunology (XTI)
- Hearing Systems
- Magnetic Resonance
- Medical Isotopes and Dosimetry
- Optical Sensing and Imaging Systems (OASIS)
- UltraSound and Biomechanics (USB)

DTU Health Tech has identified six key areas, or flagships, that define the department's technology-applied research and education

The six research flagships are interdisciplinary by nature and are based on the needs and requirements from the health sector and industry within health technology, as well as the strengths within the department.

The six flagships represent the key areas where we see ourselves as attractive for industry as strategic collaborators and where we can contribute to education of students at a world leading level for the benefit of industry and society. To develop the best and most innovative solutions to benefit patients and society, we believe that collaboration between different sectors is essential.

The six flagships are:

- Diagnostic Imaging
- Digital Health Lab
- Personalised Therapy
- Precision Diagnostics
- Sensory and Neural Technology
- Surgical Technology

The department's unique interdisciplinary academic environment with competences in among other things physics, chemistry, biology, mathematics, and computer science supports our goal of developing world-class technology, knowledge, and innovation in the health area to benefit patients and society. More information can be found [HERE](#).

Section for Ultrasound and Biomechanics

The Section for Ultrasound and Biomechanics (USB) develops and investigates advanced ultrasound methods from the basic acoustics to the clinic and everything in between. This includes development of advanced silicon transducers, 3D printed phantoms, advanced fluid simulations, construction of ultrasound research scanners, state-of-the-art ultrasound simulation, synthetic aperture imaging algorithms, tensor velocity imaging, super resolution imaging, animal studies and clinical investigations. The science includes the invention of methods, patenting, and translation into commercial products.

The Section encompasses three groups: Cardiovascular Biomechanics, MEMS, and Center for Fast Ultrasound Imaging (CFU).

Cardiovascular Biomechanics

In the Cardiovascular Biomechanics group our research is focused on development of computational models of the human cardiovascular system. We combine computational biomechanics, advanced 2D and 3D imaging methods, and state-of-the-art ultrasound techniques for quantification and visualisation of blood flow and soft tissue motion. This is applied in patient-specific finite element-based models to gain more and new knowledge of cardiovascular biomechanics in health and disease. The simulation models are also used for evaluation of the precision and accuracy of new imaging technology like 3D vector flow imaging and blood pressure estimation.

MEMS Applied Sensors Group

The scientific efforts of the MEMS group are focused on advancing medical ultrasound imaging by researching capacitive micromachined ultrasound transducers (CMUTs) as an alternative to the commonly used piezoelectric transducers. The MEMS group has developed both linear array and row-column based CMUT transducers fabricated using silicon-based nano and microfabrication.

Major accomplishments include:

- Development of robust and stable processes for CMUT fabrication in the DTU Nanolab cleanroom for both fusion and anodic bonded devices.
- Development of analytical and finite elements models for design of CMUT arrays.
- Fabrication of six generations of linear array medium frequency probes and one high frequency probe.
- Development of five generations of row-column transducers for 3D ultrasound imaging using integrated apodization for the first time.
- Established a laboratory for characterization of CMUT devices both on wafer level and on single chip.
- Established a packaging laboratory for assembly of ultrasound probes.

The Center for Fast Ultrasound Imaging

The Center for Fast Ultrasound Imaging (CFU) was inaugurated in 1998 by Professor Jørgen Arendt Jensen and has pioneered a range of innovations in medical ultrasound. The major contributions include ultrasound simulation with the development and maintenance of the gold standard Field II program, and the development of ultrasound research scanners, including the pioneering RASMUS and SARUS systems. CFU also invented transverse oscillation vector flow imaging (VFI), which was commercially introduced on BK Medical scanners for the world's first clinical VFI. Major results have also been presented within anatomic and vector flow synthetic aperture imaging in 2D with commercial arrays and in 3D with row-column arrays, which has resulted in 27 sold patents and 52 graduate PhDs from CFU.

Section for Ultrasound and Biomechanics cont.

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CFU is currently sponsored by a €10 million ERC Synergy grant for super resolution imaging and houses one professor, a senior researcher, 2 postdocs and 19 technical and clinical PhD students. We have collaborations with several departments at DTU as well as the University of Copenhagen and University hospitals in the Copenhagen region. We have extensive research facilities with 5 research scanners (SARUS and 4 Verasonics scanners), robot measurement systems, flow rigs, extensive collection of probes and commercial scanners and several cluster and GPU computers for finite element and ultrasound simulation and image processing. Further information can be found [HERE](#).

Professor / Associate Professor in Advanced Ultrasound Imaging

DTU Health Tech at DTU invites applications for Professor and Associate Professor positions at the Section for Ultrasound and Biomechanics.

The incoming Professor or Associate Professor will conduct and lead research in advanced ultrasound imaging, obtain funding for expanding the research group, and teach in Biomedical Engineering courses with an emphasis on imaging, programming, and signal processing at all levels.

Responsibilities and Tasks

The research is conducted at the Center for Fast Ultrasound Imaging (CFU) in the USB section. The focus is on researching advanced ultrasound imaging methods and translate them from the basic acoustics all the way to the clinic. The current emphasis is on super resolution imaging in 2D and 3D using synthetic aperture methods for anatomic and flow imaging. The research includes developing estimators and processing methods for beamforming, motion estimation, and image quantification for both traditional arrays as well as CMUT and row-column arrays.

Of major importance is the implementation on advanced research scanners and the clinical evaluation in collaboration with hospitals. The scientific contributions, thus, span from advanced simulations of the acoustics to implementation, laboratory experiments, and validation. It is the expectation that you will be able to be part of the leadership of the research and expand the research portfolio.

Person Specification

DTU are seeking candidates who have strong proven track records in research and education in the field of advanced ultrasound imaging. You must be able to significantly contribute to fundraising, the innovation in the above fields, and be a research leader at the highest international level. This entails being the main advisor of PhD students, writing papers and patents, raising research funds for hiring PhD students and postdocs, developing new strategic initiatives within research and teaching, and maintaining the international level of the research facilities at CFU and the USB Section.

Professor / Associate Professor in Advanced Ultrasound Imaging cont.

You value visionary and meaningful communication, and you are motivated by delivering and take lead in engaging teaching at the BEng, BSc, MSc, and PhD levels. The position will involve teaching in existing courses and developing new relevant course materials by bringing the newest results from your research into our teaching to educate the new generation of engineering graduates within Medicine & Technology.

Teaching is conducted in collaboration with relevant DTU departments and external partners on topics within advanced ultrasound imaging and general medical imaging. You will develop teaching activities to support DTU's ambition to continue to have Europe's best engineering education.

Furthermore, the successful candidate will:

- have a technical/scientific education at PhD level with international recognition within the research field;
- have a strong profile in research documented through original publications and citations in international scientific journals and proceedings;
- have a track record in research funding;
- have experience of external cooperation and exploitation of research results in interaction with industry;
- demonstrate a strong international network;
- be creative, innovative, driven by scientific curiosity, and eager to collaborate with students, colleagues, and external partners;
- have good communication skills in English;
- be open-minded and teamwork-oriented in striving for common, ambitious goals;
- have experience in supervising PhD students.

DTU employs two working languages: Danish and English. You are expected to be fluent in at least one of these languages, and in time are expected to master both. For international candidates, DTU provides Danish language courses enabling you to teach in Danish within 2–3 years.

Assessment Criteria

In the assessment of the candidates, consideration will be given to:

- documented experience and quality of teaching and curriculum development;
- research impact and experience, funding track record, and research vision;
- international impact and experience;
- societal impact;
- innovativeness, including commercialization and collaboration with industry;
- leadership, collaboration and interdisciplinary skills;
- communication skills.

DTU is a leading technical university globally recognised for the excellence of its research, education, innovation, and scientific advice. We offer a rewarding job in an international environment with many opportunities for professional and personal growth. We strive for academic excellence in an environment characterised by collegial respect and academic freedom tempered by responsibility.

As a technical university, we are mindful of our agency in the underrepresentation of women and minority groups in the world of technology – as academics, as well as entrepreneurs and innovators. We are committed to alleviating the underrepresentation of women and minority groups in academic positions at the university and we, therefore, invite all interested candidates irrespective of age, gender, disability, race, religion, or ethnic background to apply.

If you have taken a career break or periods of leave, such as maternity/paternity, adoption, or parental leave, which may have impacted your career path, you may wish to disclose this in your application. The selection committee will recognise the effect that this may have had on your academic record.

Appointment Process and How to Apply

Further information may be obtained from Professor Jørgen Arendt Jensen, tel: +45 4525 3924, e-mail: jaje@dtu.dk.

An executive search exercise is being undertaken by Perrett Laver to assist the recruitment committee. For informal inquiries about the role please contact Sarah Silbert (Sarah.Silbert@perrettlaver.com).

To apply online, please visit www.career.dtu.dk open the link 'Apply online', and fill out the online application form. Please submit your application no later than **Friday 16th December**. The following must be attached in English.

Applications should consist of:

- Cover letter addressed to the President;
- A vision for teaching & research;
- CV including employment history, list of publications indicating scientific highlights, H-index and ORCID (see <http://orcid.org/>);

- Teaching portfolio including documentation of teaching experience;
- Academic Diplomas (MSc/PhD);
- The five most important journal articles you have published. This should also include a description of your most important scientific contributions, and it should also be explained how these articles relate to the future vision for your research.

All interested candidates irrespective of age, gender, disability, race, religion, or ethnic background are encouraged to apply.

Salary and Terms of Employment

The appointment will be based on the collective agreement with the Danish Confederation of Professional Associations. The allowance will be agreed upon with the relevant union.

For international applicants support for relocation and integration may be offered.



Danish Research Environment

Denmark is a hub of research excellence. The country is among the best in the world in terms of its high academic impact, the number of students who go on to undertake a PhD, the monetary investments in research and development, and its success in attaining research funding/grants.

The country has excellent funding opportunities from both public and private sources and compared to the size of the country, these opportunities are among the most plentiful globally.

A recent report from the Danish Ministry of Higher Education and Science, compiled from statistics from the OECD, has identified the following successes in Danish research. Compared against other members of the OECD, Denmark ranks:

- 1st for the share of publications co-authored with business partners;
- 1st for public R+D spending relative to GDP and within the top 10 for private R+D spending;
- 2nd for the top 10% of most cited scientific publications;

- 2nd for EU funding per capita;
- 4th for citations per publication;
- top 5 for PhD degrees per million capita;
- top 5 for field-weighted academic impact across science, technology, health, agricultural and veterinary sciences, community knowledge, and humanities;
- top 10 for international co-publications (almost 60% of all Danish scientific publications are international co-publications);
- among the top EU countries for successfully receiving the most funding from the EU framework programme Horizon 2020, measured per capita;

Additionally, Copenhagen has placed 1st in the top 10 European Regions for the Future by 2018/2019 FDI Intelligence, the largest FDI centre of excellence globally.

For more information on Denmark's outstanding investment into research and development, please visit: [Ministry of Higher Education and Science](#) and [OECD Research and Development Statistics](#).

Living in Copenhagen

Living in One of the Most Livable Cities

Copenhagen is a green city surrounded by water and parks. It is famous for its dedicated bike culture, but the city also has a very well-developed public transportation system. It is easy to get around in the city by bike, train or subway. Additionally, Copenhagen Airport is a gateway to Europe, so you can easily explore the rest of Europe during weekends and holidays.

An International Working Place

DTU is a multicultural research environment. It aims to recruit highly qualified global talent, and in most parts of the university, you will work with international colleagues from many different countries and backgrounds.

Informal Working Atmosphere

The working atmosphere is characterised by being free and informal. There is an open dialogue based on the interaction between team members and team leaders, and the work culture strongly encourages creativity and independent decision-making.

Focus on Family Life

Denmark is an appealing country for families. It has an excellent education system with public and private schools, attractive holiday schemes and low crime rates. All families in Denmark are offered public childcare and can choose between free state schools or private schools.

Work-Life Balance

DTU respects the family life of its employees and believes that there should be a balance between family and friends, alongside having a career at the university. According to OECD's Better Life Index (2017), Denmark ranks 2nd in terms of work-life balance.

A City Filled with Activities

Copenhagen is a vibrant city with a wide range of culture and leisure activities, with clubs, sports facilities and a wide range of associations. The work-life balance ensures that staff have enough time on weekends and holidays to refresh and come back to the workplace full of new energy.

Special Tax Implications

As an international professor recruited from abroad you will be eligible for researcher taxation. DTU will apply for coverage by the researcher tax scheme on your behalf. Researcher taxation is set for a maximum period of 7 years, regardless of whether you are employed full time or part-time. Researcher taxation entails an 8% labour market tax and a subsequent flat-rate tax rate of 27%, equating to a total tax rate of 32.84%.



AMERICAS ASIA PACIFIC EMEA

Suite 414, The Greenway,
Ardilaun Court,
112-114 St. Stephen's Green,
D02 TD28 Republic of Ireland

T: +353 (0) 1 905 3706

E: dublin@perrettlaver.com