

PhD scholarship in *3-D Super Resolution Ultrasound Imaging*

A 3-year PhD scholarship is available at the Center for Fast Ultrasound Imaging (CFU), Department of Health Technology and at DTU Compute from early 2025 sponsored by the European Research Council (ERC) and the Department of Health Technology at DTU. It is conducted in collaboration between CFU, DTU Compute, DTU Physics, the MEMS group at DTU Health Tech, the University of Copenhagen, and the Copenhagen University Hospital (Rigshospitalet) in the ERC Synergy Grant “3-D Super resolution Ultrasound Real time imaging of Erythrocytes” - SURE.

The SURE project develops and researches a new super resolution ultrasound imaging method capable of resolving 3-D capillary flow in the human body. The approach tracks the motion of the individual red blood cells (erythrocytes) in a three-dimensional volume for a full visualization of anatomy, flow, and perfusion. The approach can potentially yield a paradigm shift in the scientific study, diagnoses, and treatment of cancer, diabetes, and vascular diseases at the capillary level, as it enables the possibility of volumetrically visualizing capillary perfusion in real-time at frame rates above 20 Hz without injection of contrast agents.

Responsibilities and tasks

This project develops the processing pipeline for making three-dimensional SURE imaging by further developing the current 3-D pipeline. The algorithms should be optimized to data from row-column arrays for 3-D imaging and implemented for real time processing. The main emphasize is on making quantification of the small vessel flow from the volumetric data and derive clinical relevant biomarkers in collaboration with the groups at the University of Copenhagen. A major focus is on validating the in-vivo data from animal studies with microCT scans of the organs performed at DTU Physics.

The research is conducted in a truly multi-disciplinary environment consisting of the 6 academic partners specializing in advanced ultrasound imaging, silicon CMUT probes, animal experiments, image processing, CT scanning and clinical investigations, and the main purpose is to translate the SURE method from a research idea to the clinic.

Qualifications

Candidates should have a two-year master's degree (120 ECTS points) or a similar degree with an academic level equivalent to a two-year master's degree. Experience with digital signal processing is desirable. Similarly, knowledge of medical imaging and acoustics will also be beneficial.

Approval and Enrolment

The scholarship for the PhD degree is subject to academic approval, and the candidate will be enrolled in one of the general degree programmes at DTU. For information about our enrolment requirements and the general planning of the PhD study programme, please see the [DTU PhD Guide](#).

We offer

DTU is a leading technical university globally recognized for the excellence of its research, education, innovation and scientific advice. We offer a rewarding and challenging job in an international environment. We strive for academic excellence in an environment characterized by collegial respect and academic freedom tempered by responsibility.

Salary and appointment terms

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. The period of employment is 3 years.

You can read more about [career paths at DTU here](#).

Further information

Further information is available at www.cfu.dtu.dk or from Professor Jørgen Arendt Jensen, tel: +45 4525 3924, e-mail: jaje@dtu.dk.

Please do not send applications to this e-mail address, instead apply online as described below.

You can read more about Department of Health Technology on www.healthtech.dtu.dk and about CFU at www.cfu.dtu.dk/

Application

Please submit your online application no later than **January 31, 2025 (local time)**. Apply online at www.career.dtu.dk.

Applications must be submitted as **one PDF file** containing all materials to be given consideration. To apply, please open the link "Apply online", fill out the online application form, and attach **all your materials in English in one PDF file**. The file must include:

- A letter motivating the application (cover letter)
- Curriculum vitae
- Grade transcripts and BSc/MSc diploma
- Excel sheet with translation of grades to the Danish grading system (see guidelines and [Excel spreadsheet here](#))

Candidates may apply prior to obtaining their master's degree but cannot begin before having received it.

Applications and enclosures received after the deadline will not be considered.

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

DTU Health Tech creates health technology to improve health and well-being for humans in collaboration with companies, hospitals as well as national and international researchers. The cross-disciplinarity at the department, which includes mathematics, computer science, physics, chemistry and biology, provides the foundation for new and innovative technology for the future.

Technology for people

DTU develops technology for people. With our international elite research and study programmes, we are helping to create a better world and to solve the global challenges formulated in the UN's 17 Sustainable Development Goals. Hans Christian Ørsted founded DTU in 1829 with a clear vision to develop and create value using science and engineering to benefit society. That vision lives on today. DTU has 11,500 students and 6,000 employees. We work in an international atmosphere and have an inclusive, evolving, and informal working environment. Our main campus is in Kgs. Lyngby north of Copenhagen and we have campuses in Roskilde and Ballerup.