

NTNU - knowledge for a better world

The Norwegian University of Science and Technology (NTNU) creates knowledge for a better world and solutions that can change everyday life.

PhD research fellowship in ultrasound for non-destructive testing in CIUS (IE 117-2018)

The Norwegian University of Science and Technology (NTNU) is offering a 3-year PhD position in ultrasound and signal processing. The theme is non-destructive testing in pipelines and the project is a collaboration with the industrial company [Halfwave](#), a dynamic young company gathering experts in ultrasound technology.

The project is part of [Centre for Innovative Ultrasound Solutions](#) (CIUS) a Centre for Research-based Innovation (SFI) funded for 8 years by the Research Council of Norway. CIUS is a collaborative effort between 11 ultrasound industry companies, 3 universities and a university college, SINTEF, and 5 public health partners. CIUS has large multidisciplinary research environment across geographical locations; at NTNU, Trondheim; The University of Oslo (UiO), Oslo; and the University College of South-East Norway (USN) in Horten.

In this project the candidate will acquire a deep understanding on the propagation of acoustic waves in solid materials (pipelines) and how anomalies such as cracks can influence their propagation. She/he will study aspects of sound propagation to improve the sensitivity of acoustic waves to such defaults. The candidate will use simulation tools such as COMSOL Multiphysics to model the propagation of sound waves in pipes and validate these with experimental data.

The candidate will be affiliated to NTNU in Trondheim and has the main supervisor at NTNU, has day-to-day supervision at UiO in Oslo, all in close collaboration with HalfWave (also located in Oslo).

Workplace: Oslo; at the group for digital signal processing and image analysis at the Faculty of Mathematics and Natural Sciences, UiO. It is also expected that the candidate travels frequently to NTNU in Trondheim and spends time with the corporate partner HalfWave.

Detailed description of the project

Stress corrosion cracking poses a serious threat to pipeline integrity. To mitigate this risk, oil and gas operators spend significant capital in inspection of pipelines. The current tools, however, are reported to have issues with the sensitivity and sizing of small cracks especially for gas pipelines. Halfwave has been using ultrasound and the half-wave resonance in gas pipes to detect surface anomalies for some years now. Recently they observed that the waves generated inside the pipe wall propagated a significant distance along the pipe and were sensitive to material inhomogeneities such as cracks. Preliminary theoretical studies and experiments show promising results for the use of guided waves to detect cracks in the wall of gas pipes. The aim for this PhD project is to bring deeper understanding of the experimental results, conduct new experiments and simulations to foster new concepts, and explore new analysis methods.

Qualifications

The successful candidate holds an MSc degree in acoustics, physics, mathematics, signal processing, electronics, or computer science with an emphasis on wave physics and signal processing. CIUS aims to be a world-leading center for research and innovation in next-generation ultrasound technologies. Candidates for this position will be selected in accordance with this aim and expected to be in the upper segment of their class with respect to academic credentials.

Good analytical and programming skills are essential. It is imperative that the candidate has a proven ability to work in an experimental setting and is willing and interested in doing laboratory work. Besides technical skills, we are looking for a curious, ambitious candidate who is highly motivated to do research and contribute to the work carried out in CIUS. Good communication skills in both oral and written English are expected. We strongly encourage that the application is accompanied by a short cover letter explaining briefly how the applicant's background and education fit the goals and requirements of this project.

Formal regulations

Appointments are made in accordance with the regulations in force regarding terms of employment for Ph.D. candidates issued by the Ministry of Education and Research, with relevant parts of the additional guidelines for appointment as a Ph.D. candidate at NTNU.

Applicants must undertake to participate in an organized Ph.D. programme of study during their period of employment. The person who is appointed must comply with the conditions that apply at any time to employees in the public sector. In addition, a contract will be signed regarding the period of employment. Applicants must be qualified for admission as Ph.D. student at NTNU. See <http://www.ime.ntnu.no/forskning/phd> for information about Ph.D. studies at NTNU.

The engagement is to be made in accordance with the regulations in force concerning State Employees and Civil Servants, and assessments regarding the legislations regulating export control. The positions adhere to the Norwegian Government's policy of balanced ethnicity, age, and gender. Women are encouraged to apply.

Salary conditions

The position is in code 1017 Research fellow, and are normally remunerated at gross NOK 449 400 before tax. There will be a 2 % deduction to the Norwegian Public Service Pension Fund from gross wage.

General information

The Faculty of Information Technology and Electrical Engineering wants to attract outstanding and creative candidates who can contribute to our ongoing research activities. We believe that diversity is important to achieve a good, inclusive working environment. We encourage all qualified candidates to apply, regardless of the gender, disability or cultural background. NTNU wishes to increase the number of women in its workforce, and female candidates are therefore encouraged to apply.

Under Section 25 of the Freedom of Information Act, information about the applicant may be made public even if the applicant has requested not to have his or her name entered on the list of applicants.

The application must contain

- A one-page cover letter including an explanation of how your research interests and background would fit the position.
- Information about education and relevant experience (academic CV).
- Certified copies of academic diplomas and certificates. (Applicants from universities outside Norway are kindly requested to attach a [diploma supplement](#) or a similar document, which describes in detail the study and grading system and the rights for further studies associated with the obtained degree.)
- Names and contact information of at least two references

Incomplete applications may not be taken into consideration.

The application must be sent electronically as one combined PDF file via this page (Jobbnorge.no).

For further information, please contact:

Main supervisor

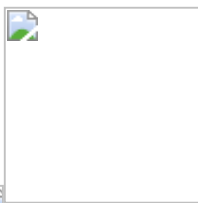
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Co-supervisor

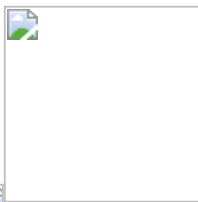
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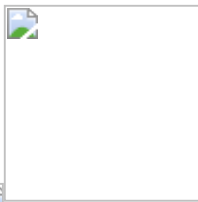
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Co-supervisor

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Mark the application IE 117-2018

New deadline for application: **30 September 2018**

Jobbnorge ID: 153181, Deadline: The application deadline has passed