

# Digital twin for ship behavior and response in ice operation

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## Summary

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*In this position you need to develop a digital twin of a ship operating in ice infested waters. You will use existing numerical model, which you will improve and validate using experimental ice-structure interaction data gathered on a real ship. The experimental data involves ship motion and performance data, strain gage data, and ice conditions information (visual observation together with camera-based identification system). Therefore, you must come up with a working solution that can integrate observational measured data (with different sampling frequencies) into a simulation environment. At first, this simulation environment will be Abaqus. This integration is referred to as digital twin framework. As part of this framework development, the research should quantify the uncertainties and relevant simplifications, which would enable fast model development (real-to-digital) and accurate ice-structure interaction simulations. There are two goals in this work. Short term goal is to develop realistic structural analysis model, while long term goals is to reach a reduced order model (ROM) that is deployable in a DSS (decision support system).*

Research field:	Environmental, marine and coastal technology
Supervisors:	Dr. Vladimir Kuts Mihkel Kõrgesaar
Availability:	This position is available.
Offered by:	School of Engineering Kuressaare College
Application deadline:	Applications are accepted between January 01, 2025 00:00 and January 24, 2025 23:59 (Europe/Zurich)

## Description

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### Supervision

Main supervision: Mihkel Kõrgesaar (TalTech)  
Co-supervisors: Vladimir Kuts (TalTech)

### Requirements

The performed work combines computational and experimental research with system engineering. The applicant should have good understanding in either one of those topics: ice mechanics, solid mechanics, modeling, data handling/flow between systems. The candidate should prove his/her capabilities in writing the technical report and scientific papers in high quality journals. Good skills in English, writing and oral, are required. Experience in collaborative research/publication with the existing TalTech staff is also a plus. The applicant for the position must have a Master's degree and must fulfill the requirements for doctoral students at the Tallinn University of Technology (<https://taltech.ee/en/phd-admission>). During the assessment emphasis will be put on your potential for research, motivation, and personal suitability for the position.

### Employment & Funding:

The position is at the Tallinn University of Technology and includes some work as a teaching assistant in our courses. The expected duration of doctoral studies is four years. The base monthly gross salary for Early stage researchers at Tallinn University of Technology is 2300€.

### How to apply to this position:

Follow the instructions in <https://taltech.ee/en/phd-admission> and for hybrid meeting email [mihkel.korgesaar@taltech.ee](mailto:mihkel.korgesaar@taltech.ee)

1. Motivation letter (maximum one A4 page, important: provide clear, but honest, evidence of your skills related to the job description and requirements above). The letter should introduce two referees who can be contacted directly.
2. CV and other proof of scientific activity (publications, conference papers etc.)
3. Copies of the bachelor's and master's degree certificates and official transcript of records, and their translations, if the originals are not in English.
4. An English abstract or summary the MSc thesis.
5. Proof of proficiency in English



6. Copy of the identification page of your passport

**Further information**

- Job location: Kuressaare, Estonia



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