

System identification in ice-structure interaction

Type of scholarship:

We are seeking a candidate degree seeking PhD scholarship for 36 months.

Period of the scholarship:

The start date for the PhD is set to August 2021- and ends in August 2024.

Short description of the scholarship:

Many Arctic offshore structures are old, reaching their predicted end of service life. Prolonging their operational life requires implementations of systems for assessment of their structural integrity in order to prevent structural failure and measure the effect of rehabilitation, in sum preventing environmental disasters in vulnerable areas. New developments of offshore wind projects at locations where drifting ice is expected to occur during the lifetime of the project, also rely on accurate estimation of fatigue life, predictable maintenance and operational ability under different ice conditions. Furthermore, the challenge of designing the support structures to withstand ice loading and ice-induced vibrations has arisen because of the currently high uncertainty in measured ice loads used for design model validations and design standard benchmarking. Operational modal analysis (OMA) and structural health monitoring (SHM) are strategies to monitor the dynamic properties of a structure in its operational environment and to detect damage, respectively. These strategies are often interconnected and well established in predictive maintenance and operational monitoring in several fields of engineering, yet their ability to function on structures located in ice-infested waters remain unknown due to fundamental knowledge gaps. Succeeding to identify the features insensitive to or with traceable change for different ice conditions is essential to enable the very simplest level of any SHM system, namely to detect damage, to be applied to structures deployed in the Arctic. Otherwise, manual inspections in a harsh environment are the only alternative. Equally important are the modal parameters for different ice conditions fundamental for accurate modelling of ice-structure interaction. The scholarship is intended for the field of nonlinear dynamics and more specifically identify underlying nonlinear models from measurements, i.e. nonlinear system identification. The candidate shall develop and apply system identification techniques to better understand ice-structure interaction.

Qualification and requirement:

- Master degree in Civil Engineering, Mechanical Engineering, Marine Engineering, Physics, Cybernetics, Applied Mathematics, Signal Processing
- Other, if applicable

In addition, for all applicants the following applies:

- Fluent English language, both written and spoken with certificates of TOEFL minimum 95 or IELTS minimum 6.5
- Chinese citizenship documents (copy of his/her passport or national ID of

P.R. China

- CV
- A motivation letter

Deadline for submission of application: 15th Feb 2021

Scholarship: 17 000NOK/month for a period of 36 months (degree seeking PhD)

Supervisor info: Torodd Skjerve Nord, Associate Professor, NTNU, department of Ocean Operations and Civil Engineering, Torodd.nord@ntnu.no, Tel (optional):

Email and contact information for where to send the application:

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