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## **Model Identification of Marine Operations under Environmental Uncertainty**

**Type of scholarship:** degree seeking PhD

**Period of the scholarship:** August 2021 – August 2024

### **Short description of the scholarship:**

To date, the industrial internet of things is of high importance for marine operations. Digitalization has become a key aspect of making the marine industries more innovative, efficient and fit for future operations. One of the most attractive aspects is the concept of digital twins (DT), which refers to a digital replica of physical assets, processes and systems that can be used as advanced tools for design, operation, and life cycle service. A DT is therefore attractive, as it can take sensor data into the digital model to achieve on-board support such as risk assessment, operation planning and prediction.

This project aims to develop models with high fidelity in marine operations. Considering the challenges in marine operations, including dynamical interactions between ship and crane, and environmental perturbations, how to identify the parameters such as the hydrodynamic parameters for modeling marine operation will be the main concern of the PhD position. NTNU Aalesund has built a research level of simulation center to test technology, methodology and procedure for marine operations at Norwegian Maritime Centre (NMK), Ålesund, Norway. This PhD will use related facilities in the simulation center and focus on model identification methods for marine operations.

### **Qualification and requirement:**

- A master's degree in automation, computer science or maritime related engineering related with good grades, with an average grade B or better in NTNU's grading scale, or an education at the equivalent level.
- The candidate should have knowledge on data analysis, such as PCA, sensitivity analysis and uncertainty analysis; and good experience on machine learning, like SVM and neural network.

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

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**Deadline for submission of application:** 14<sup>th</sup> Feb 2021

**Scholarship:** 17000 NOK/month for a period of up to 36-48 months (degree seeking PhD)

*According to the NTNU-CSC agreement*

*CSC will provide a living stipend, currently 12,500 NOK per month for a period of up to forty-eight (48) months, and a round-trip international airfare between China and Norway. NTNU will provide a monthly additional funding for a period of up to forty-eight (48) months, which combined with the CSC living stipend ensures the sufficient income (currently minimum 17,000 NOK per month) required by NTNU. No tuition fees will be charged for PhD candidates at NTNU.*

*According to the current policy at NTNU, the department will be responsible for the top-up funding from NTNU. (more info please see attachment 2)*

**Supervisor info:**

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