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 candidate - Data-based Ship Motion Prediction in Offshore Operations

The Mechatronics lab at Faculty of Marine Technology and Operations has vacant one PhD position which runs over 4 years including 25 % teaching. This is a resarch position that will lead ut to the doctoral degree (PhD) in addition to contributing to professional development at the faculty. The workplace is at NTNU in Ålesund, but the candidate will also participate in an organized doctoral degree program at NTNU in Trondheim. The candidate will, together with the academic research group, and research teams in the collaborative companies, develop knowledge within the specified area of resarch; data-based ship motion prediction in offshore operations.

Description of the PhD study

With the growth of emerging demands from offshore applications, such as seabed survey, pipeline maintenance and offshore oil installations, the complexity of ship maneuvering during offshore operations, increases as more constraints from position accuracy, limited working space, and collision avoidance between vessels and floating structures, need to be taken into consideration. To assist to address the complexity and guarantee the performance, new knowledge and technology for such constrained ship maneuvering, are urgently demanded.

Ship motion prediction is of great importance. The ship dynamic varies with navigational status such as the load and the speed, and perturbations orginated from the operation environment including waves, wind and currents are complex and unpredictable. It is difficult to predict the ship motion without fully dynamic model.

Data based predicition in this case can address the difficulty of obtaining precise dynamic model. On the one hand, huge amount of sensor data can be gathered from different sources of the ship in various maneuvering scenarios. On the other hand, analysing and modelling of these sensor data by using artificial intelligent methods such as neural network and extended Kalman filter, can be achieved for prediction purpose, which consequently can provide valid suggestions and assist the pilot to increase maneuvering ability.

This PhD will focus on data-based prediction in the offshore operations. Data can be obtained either from real or simulated vessels. Furthermore, weather data should be taken into consideration, from a practical perspective, to enhance the prediction precision and provide the pilot with valid suggestions.

Qualifications

- MSc in automation, or computer science, with an average grade B or better measured in ECTS (European Credit Tranfer System) grades, or an education at the equivalent level
- Good programming skills
- Good theoretical and analytical skills
- Ability to work independently as well as in team
- Potential for research at an international level and keen interest in the wider context of own research. Ability to engage in cross-diciplinary teams

Written and oral fluency in English. The following tests can be used as such documentation: TOEFL, IELTS or Cambridge Certificate in Advanced English (CAE) or Cambridge Certificate of Proficiency in English (CPE). Minimum scores are:

- TOEFL: 600 (paper-based test) 92 (Internet-based test)
- IELTS: 6,5 with no section lower than 5.5 (only Academic IELTS test accepted)
- CAE/CPE: Grade B or A

In extraordinary circumstances, formal documentation of language skills can be relinquished. In such cases the candidate's language skills will be assessed in a personal interview.

Extra requirements

- Good at signal processing
- Have knowledge in artificial intelligense, especially the experience related to prediction

Conditions

It is essential that the succesful candidate filles the requriement for admission to a doctoral program. The PhD candidate must work at NTNU in Ålesund and participate in an organized doctoral study. The sucessful candidate will be part of a creative and informal academic environment that places heavy demands on independence, ability to take initiative and to cooperate.

PhD candidates are remunerated in code 1017, starting at wage level 50, currently gross NOK 430 200 before tax. There will be a 2 % deduction to the Norwegian Public Service Pension Fund from the gross wage.

The engagement is to be made in accordance with the regulations in force concerning State Employees and Civil Servants. The position adheres to the Norwegian Government's policy of balanced ethnicity, age and gender. There are few womein in the faculty and women are encouraged to apply. According to the new Freedom of Information Act, information concerning the applicant may be made public even if the applicant has requested not to be included in the list of applicants.

A CV with full details of tranining and practice must be included in the online application, together with certified copies of diplomas and certificates.Applicants will be invited for interviews in which original diplomas/certificates etc. are expected to be presented

Supervisors: Prof. Houxiang Zhang, Prof. Thor I. Fossen, and Dr. Bjørnar Vik (Rolls-Royce Marine).

More information about the position can be obtained from Prof. Houxiang Zhang, hozh@ntnu.no.

Jobbnorge-ID: 126517, Søknadsfrist: Avsluttet