POSEIDON – MSCA DN: DC08

PhD Project Title: Offshore infrastructure resilient design

Enrolment in Doctoral degree(s): Norwegian University of Science and Technology
Supervisors: dr. Nallathamby Sivasithamparam and dr. Zhongqiang Liu.
Recruitment host: Norvegian Geotechnical Institute
Secondment host: DNV, University of Warwick

Work description:

NGI is seeking candidates for a PhD position related to "*Offshore infrastructure resilient design*" within the Advanced Geomodelling department under the Offshore Energy Market Area. For more information about NGI, see www.ngi.no. The candidate will further be enrolled in the PhD program at the Norwegian University of Science and Technology, NTNU.

The position is attached to the Horizon Europe POSEIDON project (https://poseidon-dn.eu/) which is a Doctoral Training Network under the MSCA, including 13 individual Doctoral Candidates. The position is entitled "Offshore infrastructure resilient design" and has the number DC8 within the project. The overall objective of POSEIDON is to improve offshore infrastructure resilience against geohazards towards a changing climate. The topic for this PhD grant is advancing the knowledge of hybrid foundation behaviour under cyclic loading for offshore wind turbines.

The candidate will be responsible for developing design procedure for hybrid foundation and incorporate within the current design practices, such as PISA method, and conducting uncertainty quantification, encompassing the modelling of transformation uncertainty and spatial variability. Additionally, the research will delve into an integrated reliability-based design, specifically addressing load actions.

The successful completion of this PhD research is anticipated to yield significant contributions to the field of offshore wind turbine foundation engineering, with the following expected outcomes:

1. Hybrid Foundation: Develop an innovative hybrid monopile foundation that offers enhanced performance and cost-effectiveness compared to conventional foundations, e.g., monopiles, suction caissons.
2. Statistical Framework Establishment: Establish a generic statistical framework for quantifying and propagating uncertainties in soil properties. This will provide a valuable tool for probabilistic foundation design and risk assessment.
3. Reliability-based Design Procedure: Formulate a simple and practical procedure for reliability- and resilience-based offshore infrastructure design. This will enable risk-informed decision-making in the face of uncertainties in soil properties and extreme metocean conditions.

The applicant is expected to visit partners from the POSEIDON consortium other European countries for extended secondments of up to approximately six months and will have to participate in joint network-wide training activities abroad.

Competence needs:

The candidate must have a MSc, or other corresponding education equivalent to a Norwegian MSc covering some of the following fields: geotechnical engineering, structural engineering, or a related

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field, with a demonstrated interest in offshore wind turbine foundation design and reliability analysis. Solid skills in both programming (e.g. Fortran) and scripting (e.g. Python), are prerequisites.

Moreover, experience in one or more of the following topics will be positively valued:

- Expertise in advanced numerical modelling techniques, such as finite element analysis (FEA), is highly desirable.
- Strong background in statistics, probability theory, and machine learning.
- Excellent technical writing and strong communication skills in English.

Planned Secondment(s):

DNV, 4 months: Discuss the current design and installation methods.

University of Warwick, 3 months: Discuss and compare models and propose design strategies.

Eligibility criteria

If you already have a doctoral degree, you will not qualify for the position. The qualification requirements include the following:

- You must have a professionally relevant background in geotechnical engineering.
- Your education must correspond to a five-year Norwegian degree program, where 120 credits are obtained at master's level.
- You must have a strong academic background from your previous studies and an average grade from the master's degree program, or equivalent education, which is equal to B or better compared with NTNU's grading scale. If you do not have letter grades from previous studies, you must have an equally good academic basis. If you have a weaker grade background, you may be assessed if you can document that you are particularly suitable for a PhD education.
- Master's students can apply, but the master's degree must be obtained and documented by August 2024.
- You must meet the requirements for admission to the faculty's doctoral program (https://www.ntnu.edu/studies/phiv)

Candidates must meet all MSCA DC eligibility requirements, including the Mobility Rule. The mobility rule implies that researchers must not have resided or carried out their main activity (e.g., work, studies) in the country of the recruiting beneficiary for more than 12 months in the 36 months immediately before their recruitment date.

Benefits:

Successful candidates will receive a highly competitive salary in accordance with MSCA regulations for Doctoral Candidates. The salary includes living allowance, a mobility allowance, and a family allowance (if applicable). DC employment is expected for a period of 36 months.

Information and application

Please submit your application before **February 28, 2024** via the following application link:

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https://utwentecareers.nl/en/vacancies/1606/13-phd-positions-on-the-eu-horizon-2020-marie-skiodowska-curie-project-poseidon/

Submission must include:

- **Cover Letter:** A maximum of two A4 pages, highlighting your specific interest in the position, your qualifications, and motivations for applying. This letter should clearly articulate how your background and experiences align with the requirements of this project
- **Detailed Curriculum Vitae (CV):** The CV, should include, if applicable, a list of publications;
- **Bachelor and Master transcripts**;
- **Contact Details of Referees:** Provide the names and contact information of individuals who can professionally vouch for your qualifications and suitability for this position.

For general inquiries on the application procedures and the consortium please contact: info@poseidon-dn.eu

Details about the position can be requested at Nallathamby.Siva@ngi.no

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