

PhD Position in CIMNE MARINE (VAC-2021-42)

Title of the PhD project: Development of artificial intelligence-based tools to support the design and operation of ships and offshore structures

INTRODUCTION:

The International Centre for Numerical Methods in Engineering (CIMNE, www.cimne.com) is a research centre, created in 1987 by consortium between the Catalan Government and the Universitat Politècnica de Catalunya (UPC-BarcelonaTech), devoted to the development and application of numerical methods to a wide range of areas in engineering. CIMNE has been selected as a Severo Ochoa Centre of Excellence for the period 2019-2023, the highest level of recognition of excellence and leadership awarded to a research centre in Spain.

POSITION DETAILS

Number of vacancies: 1

Category: PhD (PHD2)

Location: CIMNE's offices of Madrid or Barcelona (to be agreed with the selected candidate)

Yearly salary (gross): 17.563,14 EUR

Working hours: Full time

Duration: 3 years

Starting date: No later than Sept 2021

FUNCTIONS TO BE DEVELOPED BY THE APPLICANT

CIMNE is looking for a **PhD Researcher** to be part of the Research and Technical Development (RTD) Group CIMNE MARINE.

The functions assigned to the candidate will be:

- Complete a PhD on Doctorado en Ingeniería Naval y Oceánica at Universidad Politécnica de Madrid. The candidate is expected to complete the PhD thesis in a maximum of three years.
- Collaborate with various research groups within CIMNE and worldwide.
- To publish a minimum of two papers in JCR journals during the PhD period, author and co-author articles in high-impact international journals
- Carry out quality research, training and management.
- Participate on the dissemination and outreach activities associated with the project
- Participate in international conferences presenting her/his work

DESCRIPTION OF THE PHD PROJECT:

The project aims at developing new methodologies for the generation of digital twin models to support the design and operation of ships and offshore structures (in particular, large offshore wind turbines). The selected candidate will investigate the application of model order reduction and deep learning techniques for the prediction of aspects such as seakeeping, power optimization including added resistance effects or structural response in waves. The methodology to be developed will be conceived to be applied throughout the whole lifecycle of the ship or platform. The project outcome will contribute to the research activities in the CP related to the design of ships and marine structures with improved performance and environmental characteristics. The validation and demonstration of the methodologies to be developed will also be a main objective of the project. For this purpose, the work will include the active collaboration with different companies as well as various research groups within CIMNE and worldwide.

References

Chinesta, F., Ladeveze, P. & Cueto, E. A Short Review on Model Order Reduction Based on Proper Generalized Decomposition. Arch Computat Methods Eng 18, 395 (2011). <https://doi.org/10.1007/s11831-011-9064-7>

Fonseca, I. A. & Gaspar, H. M., Challenges when creating a cohesive digital twin ship: a data modelling perspective. Ship Technology Research, 1-14 (2020). <https://doi.org/10.1080/09377255.2020.1815140>

A. Coraddu, L. Oneto, F. Baldi, F. Cipollini, M. Atlar & S. Savio, Data-driven ship digital twin for estimating the speed loss caused by the marine fouling, Ocean Engineering, 186, 106063 (2019). <https://doi.org/10.1016/j.oceaneng.2019.05.045>.

REQUIREMENTS

1. MSC level in Engineering, Mathematics or Physics
2. A good command of English
3. An enthusiastic attitude to conduct research, being hard-worker and critic
4. Programming skills.

EVALUATION OF CANDIDATES

The requirements and merits will be evaluated with a maximum mark of 100 points. Such maximum mark will be obtained by adding up the points obtained in the following items:

- Academic record (60%)
- Previous research and academic experience in the field of the position (20%)
- Programming skills (10%)
- Language skills (10%)

HOW TO APPLY

Candidates must complete the "Application Form" form on our website, indicating the reference of the vacancy and attaching the following documents **in English**:

- Curriculum vitae
- A motivation letter

- Academic transcripts from all Undergraduate and MSc degrees
- Name and institutional contact information of two possible referees

The deadline for registration to the offer ends on 31st May, 2021 at 12 noon.

The shortlisted candidates may be called for an interview. They may also be required to provide further supporting documentation.

CIMNE is an equal opportunity employer committed to diversity and inclusion. We are pleased to consider all qualified applicants for employment without regard to race, colour, religion, sex, sexual orientation, gender identity, national origin, age, disability or any other basis protected by applicable state or local law. CIMNE has been awarded the HRS4R label.