

THE UNIVERSITY OF MANCHESTER
PARTICULARS OF APPOINTMENT
FACULTY OF SCIENCE & ENGINEERING
SCHOOL OF ENGINEERING
DEPARTMENT OF CIVIL ENGINEERING AND MANAGEMENT
RESEARCH ASSOCIATE (ISPF PROJECT)
VACANCY REF: SAE-030082

Salary: Grade 6 £37,694 to £46,049 per annum, depending on relevant experience

Hours: Full Time

Duration: Fixed Term from 1 February 2026 until 31 January 2027

Location: Oxford Road, Manchester

Enquiries about the vacancy, shortlisting and interviews:

Name: Fangying Wang

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BACKGROUND

Project Name: Machine Learning-driven Optimisation of Hybrid Steel-Concrete System for Offshore Wind Turbine Towers

Wind energy currently accounts for the largest global energy resources transition portion in reaction to climate change. Brazil has set targets to install 16GW of offshore wind power capacity by 2050, utilising abundant offshore wind resources, especially in its extensive coastline along the Atlantic Ocean. Unlike the UK, which has been the global leader in offshore wind energy since 2008, Brazil is now in the early stages of offshore wind energy development, urgently requiring advanced offshore wind turbine tower design optimised for its environmental conditions and local resources.

The project will help Brazil achieve its 2050 target by offering design optimisation of an innovative hybrid steel-concrete system, i.e., concrete-filled double skin tubular (CFDST) sections for offshore wind turbine towers. Compared to conventional steel towers, the efficient use of concrete and steel materials in CFDST offers superior mechanical properties and savings in cost. In the project, a combined testing, numerical modelling, and machine learning (ML) aided design approach will be adopted, utilising the respective expertise in Brazil (testing and wind tower design experience) and the UK (modelling and ML techniques). We need to use large language model for an automatic

design of the tower. We target to develop an AI-driven assistant ("AI-Copilot") to automate the complex design and analysis process of the hybrid offshore wind tower structures.

We are recruiting a PDRA working on the royal society ISPF project. The project is funded through Royal Society under ISPF grant working with Brazil, and led by Dr Fangying Wang from the Department of Civil Engineering and Management, Faculty of Science and Engineering at The University of Manchester.

Overall Purpose of the Job

The successful candidate will contribute to the development of an AI-driven assistant ("AI-Copilot") to automate the complex design and analysis processes of hybrid offshore wind tower structures. The role requires a combination of expertise in structural engineering, computational modelling, and artificial intelligence. This work aligns with the University of Manchester's commitment to cutting-edge research in engineering and sustainable development, as well as the broader goals of the Royal Society to support impactful scientific endeavors.

Key Responsibilities, Accountabilities or Duties

The range of duties will include:

- Conduct original research on the integration of artificial intelligence and structural engineering design methods for offshore wind structures.
- Undertake research tasks including preparing, conducting numerical modelling, and recording outcomes for the hybrid steel - concrete system study.
- Write up results of individual research and contribute to research reports and publications.
- Present research progress and outcomes to bodies supervising research.
- Liaise with research colleagues and support staff on project - related matters.
- Analyse and interpret research results, generating ideas for improving the hybrid system design.
- Plan daily research activities within the project framework and coordinate with team members.

PERSON SPECIFICATION

Essential:

- PhD (or near completion) in Structural Engineering, Offshore Engineering, Computer Science, Artificial Intelligence, or related discipline or an equivalent qualification.
- Proven research experience in artificial intelligence and machine learning, particularly in applying AI to engineering design or analysis.

- Demonstrated experience in the development, fine-tuning, or application of Large Language Models (LLMs) (e.g., GPT, LLaMA, or similar).
- Experience in developing or integrating AI-Copilot systems or intelligent assistants to support computational modelling, simulation, or design workflows.
- Strong programming skills in Python and familiarity with AI/ML frameworks such as PyTorch or TensorFlow.
- Good understanding of data-driven modelling, optimization, and automated decision-making in engineering contexts.
- Ability to conduct high-quality, independent research and contribute to collaborative, interdisciplinary projects.
- Excellent written and verbal communication skills, with a proven track record of publications or presentations in relevant areas.

Desirable:

- Research experience in offshore wind energy. Knowledge of AI safety, explainable AI (XAI), or trustworthy AI approaches for engineering applications. Familiarity with cloud computing, high-performance computing (HPC), or distributed AI training environments.