

The Engineering Risk Analysis Group at TUM is looking to fill

2 PhD student positions within the IntelliWind project on AI-based maintenance planning for wind farms

About the ERA group at TUM:

The Engineering Risk Analysis Group (www.cee.ed.tum.de/era/) develops and implements uncertainty quantification, engineering reliability, risk & decision analysis to enhance optimal & sustainable decision-making for civil systems and the environment.

About the IntelliWind project:

The objective of IntelliWind is to train the next generation of multidisciplinary researchers who will develop intelligent systems that support autonomous wind power plant operations. The IntelliWind Doctoral Network funded by the European Commission's Horizon 2023 Marie Skłodowska-Curie Action (MSCA) consists of leading academic institutions and leading industry partners from 8 different countries (Belgium, Denmark, Germany, Spain, Netherlands, Portugal, France, and Switzerland).

Your profile:

- M.Sc. degree in engineering, applied mathematics, computer sciences or related fields.
- Excellent analytical skills, strong interest and capabilities in quantitative analysis
- Experience with stochastic methods and data analysis. Additional relevant experiences, such as risk and reliability analysis, signal processing, dynamics & control or experimental work, are a plus
- Experience in programming in Python, MATLAB, C/C++ or equivalent
- Proficiency in English (both written and oral), German is a plus
- Strong communication skills
- You have **not** resided or carried out your main activity in Germany for more than 12 months within the last 3 years (this is required by the MSCA rules, to enhance mobility among researchers in Europe).

The positions

- We offer two PhD positions, funded for 3 three years by MSCA scholarships with competitive conditions.
- PhD position 1 (DC9) is on **Optimal maintenance decision processes with transfer learning**. The project develops a data-driven framework to optimize maintenance actions directly from records of monitoring data and past maintenance activities at the wind farm level, leveraging recent developments in reinforcement learning in partially observable environments. The project will employ real-life data from wind farms. This PhD student will have secondments at Fraunhofer IWES (DE) and ETH Zürich (CH) with Prof. Eleni Chatzi.
- PhD position 2 (DC11) is on **Robust predictive maintenance planning under imperfect deterioration models**: The project develops and investigates strategies for handling the sim2reality gap, i.e., the bias between state-of-the-art models and the real world. You will explore algorithms that apply self-learning and can correct biases as data becomes available and develop robust approaches to sequential decision-making under the sim2reality gap. This PhD student will have secondments at Ramboll (DK) and TU Delft (NL) with Prof. Dimitrios Zarouchas.
- The earliest starting date is November 1, 2024, later starting dates are possible.
- The successful candidates will be enrolled in the doctoral program of the Technical University of Munich.
- You can expect a dynamic and flexible work environment in a multi-disciplinary, international team with an inclusive and supportive culture. We are located in the center of Munich.

The IntelliWind Doctoral Network

We offer you the opportunity become part of the IntelliWind Doctoral Network, which will not only facilitate sixteen doctoral candidates in reaching a high level of technical and project-specific excellence but will also provide you with many opportunities for developing skills that are transferable to a broader landscape of opportunities. You will have the opportunity to visit industry and other academic institutions within the consortium. After completing the program, you will have a thorough understanding of the process from research via innovation to industry implementation and a strong career-defining network.

Application

- Applications should include your CV, electronic copies of your academic diplomas and a short cover letter (max. one page), explaining your interest in the position and your relevant skills and experience.
- Applications should be sent as single PDF file to applications.era@ed.tum.de
- Applications will be continuously reviewed.
- People with disabilities, with essentially the same suitability and qualifications, will be preferred.
- By submitting your application to the Technical University of Munich (TUM), you also confirm that you have taken note of the data protection information of the TUM according to Art. 13 Data Protection Basic Regulation (DSGVO) on the collection and processing of personal data in connection with your application.

Share CV with the Entire IntelliWind Consortium

If you would like your CV to be shared with the entire IntelliWind consortium and potentially be contacted in case your profile fits one of the other open positions, please send a copy of your application by e-mail to the following email address: intelliwind@gmail.com. By sending your CV to this email address, you automatically consent to its circulation within the IntelliWind consortium.