The Delft Center for Systems and Control (DCSC) at Delft University of Technology (TU Delft) in the Netherlands has vacancy for a

PostDoc Position in "Health-aware control for offshore wind turbines and wind farms"

Background:. Offshore Wind Farms (WF) are gaining prominence due to the increasing interest in renewable energy. The harsh offshore operating conditions favour the occurrence of faults in Wind Turbines (WTs) components such as actuators, gearbox and converter, as well as fatigue and structural failures in blades and towers. As these phenomena may lead to costly failures of WTs, control algorithms should consider a WT health status and keep structural loads and stress or wear on components below an acceptable level. In this way, a WT residual useful life can be optimized, thus leading to lower energy costs.

Project Description: the successful candidate will be co-supervised by **Dr. Riccardo Ferrari** and **Prof. Jan-Willem van Wingerden** as part of the international project "*AIMWind – Analytics for asset Integrity Management of Wind Farms*". AIMWIND is a collaboration between the Delft Center for Systems and Control (**TU Delft**, The Netherlands), and the University of Agder and NORCE in Norway. The position will focus on developing fault-tolerant control laws, as well as structural load-limiting ones for individual WTs. At WF level, novel power dispatch algorithms will be developed with the aim of maximizing total power production while preventing to over-stress damaged WTs. While the proposed control algorithms will be developed using reduced-order models, they will be validated in medium or high-fidelity simulators, such as FAST Farm or SOWFA. Due to the uncertainty introduced by reduced order models, and the stochastic nature of the operating conditions faced by WTs, the work will also focus on uncertainty quantification and propagation.

Requirements: applicants should have the following qualifications: Ph.D. degree (or close to completion) in Systems and Control, Applied Mathematics, Mechanical Engineering, Electrical Engineering or a related field; strong mathematical skills, deep understanding of control systems theory, proficiency in numerical methods and interest to work at the intersection of System Theory and Renewable Energies; good programming skills; excellent command of English (Dutch not required); expertise in wind turbines modelling and control and in stochastic methods such as Polynomial Chaos Expansion or Gaussian Process Regression is highly appreciated.

Conditions of Employment: The position will start as soon as possible, but no later than **February 2021**, and run initially for one year, with the possibility of extension to a total of three years. Candidates in the process of obtaining their PhD degree can be considered subjected to the condition of having completed it no later than the agreed starting date.

About Delft University of Technology: **TU Delft** is an internationally recognized research university with over 20,000 students and 3,300 staff scientists. Its high quality teaching standards and experimental facilities are renowned, placing it among the **6 top universities in Europe** and top 21 in the world in the **Engineering and Technology field** (Times Higher Education 2020). TU Delft is an equal opportunity employer and committed to increase the diversity of its staff.

Application and More Information: Please send your **application** including a motivation letter, a curriculum vitae, a research statement, a list of publications, transcripts of courses with grades and obtained degrees, contact information for three academic references and up to 3 research-oriented documents (e.g. thesis, conference/journal publication) to application-3me@tudelft.nl. Dr. Riccardo Ferrari (r.ferrari@tudelft.nl) can be contacted for more information about this vacancy. The **deadline** for ensuring full consideration of an application is **October 31st, 2020**, but the position will remain open until filled.