WBG
Power Center

Invitation to: <u>WBG Power Center seminar with Prof. Huai Wang, Thursday 19th of March, at 10:00 (Teams)</u>

AI-assisted Reliability Testing, Modeling, and Condition Monitoring for Power Electronics Applications

Abstract

Power electronic converters are "hidden heroes" in numerous modern energy systems, such as wind turbines, Photovoltaics (PV), Power-to-X, electric vehicles, data centers, mobile phones, and smart homes. In contrast to CPUs/GPUs that process digitalized information, power electronic converters process electrical energy by efficiently converting voltage, current, or frequency. They are ubiquitous in electricity generation, transmission, distribution, and consumption, forming a critical part of the infrastructure for the green transition. With an increasing percentage of electricity processed by power electronics technologies, optimizing the efficiency and reliability of converters is critical to affordable, secure, and sustainable energy systems. Artificial Intelligence (AI) is increasingly solving optimization, regression, and classification problems within the energy sector, where deep electrification and digitalization intersect. This webinar focuses on the application of AI in the power electronics reliability aspect research, including AI-assisted reliability testing for testing time reduction, fast dynamic thermal modeling, and condition monitoring for predictive maintenance. A few case studies will be introduced to demonstrate how AI can assist in addressing the challenges in power electronics reliability research.

Biography

Huai Wang is has been a Full Professor at the Department of Energy (AAU Energy), Aalborg University, Denmark, since 2019, where he leads the Reliability of Power Electronic Converters (ReliaPEC) group and chairs the Mission of Digital Transformation and AI. His research focuses on efficient, reliable, and cognitive power electronic converters. Prof. Wang has initiated five short-term industrial/PhD courses, attended by over 1000 PhD students and industry engineers, and has delivered more than 30 tutorials at leading international conferences. He earned his PhD from the City University of Hong Kong in 2012 and his B.E. from Huazhong University of Science and Technology in 2007. He has conducted short-term research at MIT, ETH Zurich, and ABB Corporate Research Center in Switzerland. He received the 2016 IEEE PELS Richard M. Bass Outstanding Young Power Electronics Engineer Award and the 2021 IEEE Transactions on Power Electronics 1st Prize Paper Award. In 2023, he was elected to the Danish Academy of Technical Sciences.