UNIVERSITÀ
DI PAVIA

Ph.D. Program in Electronics, Computer Science and Electrical Engineering

SEMINAR

Artificial Intelligence–Assisted Design and Fault Diagnosis of Electric Motors for Green Transportation

Prof. Min-Fu Hsieh
National Chen Kung University

8th September 2025
Aula Magenta

Abstract: The impact of artificial intelligence (AI) is rapidly growing and is increasingly pivotal across a wide range of disciplines, from innovative scientific research to practical, everyday applications. The powerful capabilities of AI—spanning data analysis, productivity to unprecedented levels. This talk will explore the integration of AI in diagnosing motor faults and advancing motor design, highlighting how AI can significantly enhance the reliability and performance of electric motors in green transportation. It will delve into the use of machine learning and deep learning models to predict and prevent motor failures (e.g., inter-turn short-circuits, demagnetization, and bearing faults), which is essential for ensuring safety and reliability in transportation and industry. Furthermore, the talk will highlight AI-driven innovations in motor design, such as noise-reduction, offering insights into how AI can revolutionize traditional motor systems and contribute to ongoing improvements in predictive maintenance and design practices.

Bio: Min-Fu Hsieh received his B.Eng. degree in Mechanical Engineering from National Cheng Kung University (NCKU), Tainan, Taiwan, in 1991, and his M.Sc. and Ph.D. degrees in Mechanical Engineering from the University of Liverpool, U.K., in 1996 and 2000, respectively.
From 2000 to 2003, he served as a researcher at the Electric Motor Technology Research Center, NCKU. He joined the Department of Systems and Naval Mechatronic Engineering at NCKU as an Assistant Professor in 2003 and was promoted to Full Professor in 2012. In 2017, he moved to the Department of Electrical Engineering at NCKU, where he has been a Distinguished Professor since 2022. His research interests include electric machine design, motor drives, and mechatronics.

Prof. Hsieh currently serves as an Editor for IEEE Transactions on Magnetics and as an Associate Editor for IEEE Transactions on Industry Applications. He is also a Distinguished Lecturer of the IEEE Magnetics Society for 2025–2026. He has held key roles in major international conferences, including serving as Publications Co-Chair for several IEEE INTERMAG conferences and as the Local Organizing Committee Chair for the 2025 IEEE IAS Annual Meeting. He is the recipient of several honors, including the Outstanding Research Award from Taiwan's National Science and Technology Council. He is a Fellow of the Institution of Engineering and Technology (IET).

Organizer	**Ph.D. Coordinator**
Prof. Pericle Zanchetta	Prof.ssa Ilaria Cristiani

Seminar in English
For more information: pericle.zanchetta@unipv.it, giulia.tresca@unipv.it