

ICEM 2024, Torino, September 1-4 2024

Tutorial on

Advanced Manufacturability of Electrical Machines Enabled by 3D Printing Technology

Presented by:

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BIOS OF THE PRESENTERS:



Ahmed Selema received the M.Sc. degree in electrical engineering from Menoufia University, Egypt in 2018. In 2023, he received his Ph.D. degree in electromechanical engineering from Ghent University, Ghent, Belgium. Currently, he has been working as a research engineer in the Electrical Energy Lab (EELab) at Ghent University in a close collaboration with different industrial corporations in the EU. He is also a Corelab Member in Flanders Make, the strategic research center for the manufacturing industry in Flanders, Belgium. His research interests include electrical machines and drives, electromagnetics, material characterization, energy-efficient motor design, machine losses & cooling, and additive manufacturing. In these areas, he has authored or co-authored many papers in leading journals.



Peter Sergeant received the M.Sc. degree in electromechanical engineering and the Ph.D. degree in engineering sciences from Ghent University, Ghent, Belgium, in 2001 and 2006, respectively. He became a Post-Doctoral Researcher at Ghent University in 2006 (Post-Doctoral Fellow of the Research Foundation-Flanders). Since 2012, he has been an Associate Professor at Ghent University. He is currently a Professor of electrical drives at Ghent University and a Core Lab Manager in the cluster motion products of Flanders Make. His current research domain is electrical machines and drives for industrial and for sustainable energy applications.



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Abstract:

This special session aims to explore the advancements and challenges in the manufacturability of electrical machines through the integration of 3D printing technology. The utilization of additive manufacturing (AM) technology in electrical machines has revolutionized the traditional manufacturing process, offering new design freedoms, enhanced material options, and the potential for complex geometries. This session seeks to bring together researchers and practitioners to share their latest findings, theoretical advancements, and practical insights in the realm of 3D printing technology applied to electrical machine design and manufacturing.

List of Contents

The presented topics include:

- Novel design approaches facilitated by additive manufacturing technology
- Materials advancements and applications in 3D printed electrical machines
- Structural integrity and performance analysis of 3D printed electrical machines
- Thermal management strategies for 3D printed electrical machines
- Integration of AM technology in electrical machine prototyping and manufacturing processes
- Case studies and practical applications of 3D printing in electrical machine production
- Challenges and future directions in the adoption of 3D printing for electrical machine manufacturing