

IEEE INTERNATIONAL CONFERENCE ON MECHATRONICS (ICM 2025)
FEBRUARY 28TH - MARCH 2ND, 2025
Wollongong, NSW, Australia

Special Session Title

**Advanced Converters and Controls for High-Efficiency and High-Power
Density Drive Systems**

Organized by

Dr. Rabiul Islam, University of Wollongong, Australia,

mrislam@uow.edu.au

Prof. Wei Xu, Chinese Academy of Sciences, China,

weixu@mail.iee.ac.cn

Dr. Jian Ge, Huazhong University of Science and Technology, China,

gejian1994@hust.edu.cn

Senior Prof. Haiping Du, University of Wollongong, Australia,

hdu@uow.edu.au

Call for Papers

High power density and high efficiency are the key requirements for modern industrial drive systems, which significantly promote energy conservation and environmental sustainability. The commercialization of wide-bandgap devices such as gallium nitride (GaN) and silicon carbide (SiC) and advanced magnetic materials such as amorphous and nanocrystalline is enabling higher levels of power density and efficiency compared to traditional silicon-based switches and magnetic materials, which are changing the landscape of industrial drive systems. However, these innovations introduce new research challenges for both academic and industrial sectors. Moreover, enhancing the performance of the drive systems operating at high torque or thrust density represents another notable and latest research challenge. Over the past decade, various design and control methods for electric machines and power electronic converters have been developed, offering new opportunities in improving the efficiency, power density, and other performance of industrial drive systems. Consequently, this special session seeks to gather the latest design, optimization, control, and modulation techniques for enhancing the performance of industrial drives including efficiency and power density.

Topics of interest include, but are not limited to the following sectors:

- o Advanced device/material for high efficiency/power density drives;
- o Advanced converters for high efficiency/power density drives;
- o Advanced design and optimization for high efficiency/power density drives;
- o Advanced switching and control for high efficiency/power density drives;
- o Advanced machines for high efficiency/power density drives;