



The **Electrical Machines and Drives (EMAD)** Group

performs research and offers education in the areas of power electronics, electrical machines, drive control, robotics, digital signal processing and electronic circuits in industrial automation as well as in automotive applications.

Key Research Fields & Competence Areas:

- **Sensorless Control of Electrical AC Drives**
 - Induction machines
 - Synchronous and reluctance synchronous machines
 - High-speed drives
- **Non-linear Control of Power Electronics and Electrical Drives**
 - Predictive control
 - Virtual machine
- **High-Power Semiconductor Devices**
 - IGCTs in series connection
 - Optimised IGBT gate control

Institute Highlights:

- Electrical machines laboratory with 630 kVA power supply
- Rapid prototyping system for control algorithms (real-time Linux on Pentium processor)
- Automatic test bench for electrical machines and drives (max. power 90 kW, max. speed 15000 rpm)
- International cooperation with
 - University of Newcastle upon Tyne (UK)
 - Technical University of Warsaw (Poland)
 - University of Stellenbosch (South Africa)
 - National University of Singapore
- Laboratory for electrical heating

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