

The Industrial Electronics Division is part of the Institute of Control and Industrial Electronics at Warsaw University of Technology. With its about 20 employed staff and numerous PhD and MSc students the Division is responsible for education, research and development in field of drive, power quality and active filtering, renewable energy, energy storage, traction application and control of power converters.

Key Research Fields & Competence Areas:

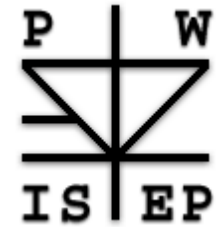
- **Converter Topologies and Advanced Control**
Multilevel, resonant and Z source converters, New control platforms based on DSP and FPGA as well as modern control methods.
- **Renewable Energy and Energy Storage**
Wind and waves energy systems based on IG and PMSG; Supercapacitors;
- **Power Quality and Active Filtering**
Active rectifiers and active shunt and series power filters
- **AC Drives Control**
New and modern control methods for IM and PMSM e.g. DTC-SVM, Feedback linearization etc; Traction drives

Institute Highlights

- DSP & FPGA design and rapid-prototyping
- Simulation models for various control strategies
- 2L-VSI back-to-back laboratory setup (3-7,5 kVA)
- 3L-VSI back-to-back laboratory setup (15 kVA)
- Multilevel cascaded PWM converters (1,5 kVA)
- Current source converter and Z-source converter laboratory setup (3 kVA)
- 3 phase line power emulator and power quality analyzer

Contact Information:

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The Electrical Drive Division is part of Institute of Control and Industrial Electronics. The Division of Electrical Drives teaches and carries out research and development in the field of energy conversion and conservation in drives, power generation, energy storages, energy saving, power conditioning and power quality. The Division with 11 permanent staff academics and 14 PhD students specialize in postgraduate teaching resulting in average yearly 30 Master thesis in Electrical Engineering and 3 PhD thesis.

Key Research Fields & Competence Areas:

Drives: Topologies, control methods and design using induction motors and permanent magnet axial and radial flux motors with specialisation of sensorless (PIPCRM, DTC) and artificial neural controllers. Industrial drives. Energy saving. Application of energy storage for compensation of demanded power variability. Automotive electrical and hybrid applications.

Electricity generation: VSIG - Variable and adjustable speed autonomous and grid connected generation systems with permanent magnet axial and radial flux radial flux generators. DFIG and autonomous (ADFIG) development. Microturbine, Diesel, powered variable speed generation. Neuronal control. Renewable energy conditioning. Fuel cell source systems.

Institute Highlights

- Permanent magnet adjustable speed generation - technology demonstration unit powered by Diesel engine.
- Autonomous ADFIG and grid connected DFIG double fed induction generator.
- Axial flux 400Hz/3000rpm permanent magnet sensorless drive.
- Microprocessors (SHARC)& FPGA prototyping
- Laboratory benches for simulation and testing of control strategies of the variable speed generation systems.

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