Univerza v Mariboru

FERI Fakulteta za elektrotehniko, računalništvo in informatiko

UNIVERSITY OF MARIBOR

Research Areas

Institute of Robotics is a part of the Faculty of Electric Engineering and Computer Science, University of Maribor, Slovenia. We are not simply a classroom university professors and lab-locked researchers, but always have a strong demand for proving our value outside of the environment and societies in which we cooperate.

The main focuses of our research work are in the fields of:

- Electric motors (control and modulations, high speed, sensorless),
- Power electronics inverters (DC-DC, DC-AC in AC-DC, control, measurements, simulations, thermal management, EMC, design of HF magnetic components),
- Alternative energy sources (photovoltaics, fuel cells, TEG),
- Mechatronics (robotics, haptics, position and force control),
- Automotive industry (processes, functional safety, batteries, BMS, power / energy management, drivetrains for EV and HEV),
- Rapid control prototyping (HIL systems, dynamic emulations of loads, model-based design),
- Programming (microcontrollers in C, Matlab, and SciLab; FPGA in Verilog and VHDL).

Our goal is and has always been to be a valuable partner of the industry and research groups, both local and international. We were and are involved in several international and local research projects, among which the following are the most important:

- HYSIS (Fuel Cell Hybrid Vehicle System Component Development, www.hysys.de, Coordinator: Daimler Chrysler, Germany),
- Hi-SEPS (Highly Integrated Combustion Electric Propulsion System, www.hi-ceps.eu, Coordinator: CRF, Italy),
- HYPSTAIR (Development and Validation of the Hybrid Propulsion System Components and Sub-System for Electrical Aircraft, www.hypstair.eu, Coordinator: Pipistrel, Slovenia),
- AUTOUNIVERSE (Automotive Quality Universities, Erasmus+, http://www.automotive-quality-universities.eu/, Coordinator: TU Ostrava, Czech Republic),
- EVA4green (Ecological Safe Vehicle for green mobility, Coordinator: SiEVA, Slovenia, Slovenian government funded).

Laboratory facilities

To ensure the high-quality research work and evaluation of research results, our group has at its disposal the following equipment:

- Spectrum analyzer,
- Single- and three-phase LISN (9 kHz – 30 MHz, suitable for AC and DC powered EUT),
- Single-path LISN (DC to 60 Hz),
- AC/DC current probes amplifiers (750 A peak),
- High voltage differential probes (200 MHz, slew rates up to 275 V/ns at 1/250 gain, ±1500 V),
- Circuit board plotter and plating system,
- Fuel cell (1.2 kW PEMFC),

- 3D printer,
- dSPACE system for testing electrical drives with induction machines,
- Bidirectional 50kW inverter system for 3ph AC electrical motors.
- DC-power source (0-600V, 0-16A, 0-10kW)
- AC or DC power source (1ph, 0-150V,55A; 3ph, 0-260V,18A; DC, 0-210V,30A)
- AC electronic load (Voltage 50-300V, 0-45A, Power 0-4.5kW, Resistance 1.11Ω-2.5kΩ.