Institute of Information Theory and Automation (UTIA)

UTIA research institute conducts fundamental and applied research in computer science, control theory, systems theory, signal/image processing, artificial intelligence, stochastic informatics, pattern recognition, and econometrics. It contributes to increasing the level of knowledge and education and to applications of research results in practice. The institute publishes the journal Kybernetika.

Key Research Fields & Competence Areas:

- Control and Decision Making Theory
  - adaptive control, Bayesian estimation and prediction with link to industrial applications, robotics, mechatronics
- Signal Processing
  - digital signal processing algorithms, parallel algorithms and architectures, field-programmable gate arrays (FPGA)
- Image Processing
  - image fusion, recognition, content-based image retrieval
- Pattern Recognition
  - statistical model-based pattern recognition, modelling random fields for scene interpretation

Institute Highlights:

- Wide international cooperation activities
- Participation in EU-funded projects and many bilateral agreements & contracts
- Long-term R&D in concepts, theory, algorithms, software and applications
- Organization of university courses and supervision of PhD students

ECPE Competence Centre

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Institute of Thermomechanics AS CR, v.v.i.

Department of Electric Machines, Drives, and Power Electronics

The Department is engaged in the analysis and modelling of electric drives and rotating machines. The most important methods for the conversion of mechanical energy into electrical energy and vice versa are investigated. Research is also focused on current problems connected with the circuit structures of power electronic converters and algorithms of the digital control and diagnostics of these converters. The mutual effects of power electronic converters with both the machines and the supply networks are analyzed.

Key Research Fields & Competence Areas:

- Electric Machines and Drives
  control techniques, modelling, multiphase machines
- Multilevel Converters
  control, topologies
- Active Power Filters
  control, topologies, industrial power networks
- Electromagnetic Interference
  inverter fed IM drives, trolleybuses, trams
- Renewable Energy
  wind power, hydro, pumped storage plants

Institute Highlights:

- Experienced Research Team
  experts of diverse expertise
- Modern Laboratory Facilities and Equipment
  3, 15, 160 kW dynamometers, dSPACE, EMC 9 kHz-1.5 GHz
- Computer Equipment
  simulation SW, µC development tools
- Co-operation with Industry
  national/international projects
- Co-operation with Universities
  national/international projects

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