UNIVERSITY OF TECHNOLOGY SYDNEY

CENTRE FOR ELECTRICAL MACHINES AND POWER ELECTRONICS (CEMPE)

UTS Sustainability Research and Consultancies

MISSION OF CEMPE

To benefit humanity through the application of electrical machines, power electronics, and related expertise in high quality research and significant industrial projects.

CEMPE

- Is a team of highly qualified experts with international and local experience
- Has strong links with Australian government research organizations such as CSIRO and Australian CRC for Renewable Energy (ACRE)
- Works in all areas of product development from research and design to prototype construction and testing
- Provides expertise in electromagnetics, magnetic materials, power electronics, control systems, electrical engineering, fluid dynamics, vibration, mechanical engineering
- Combines industrially sponsored contract research and long-term strategic research.

CORE MEMBERS OF CEMPE

- Director: Dr. J.G. Zhu, Professor of Electrical Engineering
- Team Leaders:
  - Dr. P.A. Watterson, Senior Research Fellow, for Electromagnetic Design
  - Dr. G. Hunter, Senior Research Fellow, for Power Electronics
  - Dr. Q. Ha, Associate Professor, for Computer Control
  - Dr. N. Zhang, Assocaite Professor, for Mechanical Design

RECENT PROJECTS

- Characterisation and Modelling of Nanostructured Soft Magnetic Materials for Advanced Electromagnetic Applications, Australian Research Council (ARC) Discovery Grant
- 3D magnetic property testing and modelling, ARC Large Grant
- Optimal Transcutaneous Energy Transmission System (TETS) for an Implanted Artificial Heart, ARC Linkage Grant with Ventracor
- Development of low cost high performance motor drives for electrical appliances using new soft magnetic composite materials, ARC Linkage Grant with F&P
- High Efficiency Low Cost Low Noise Variable Speed Compressor Drive for Refrigeration and Air Conditioning Systems, ARC Linkage Grant with Heatcraft Ltd
- Design and control of sensorless, brushless, linear permanent magnet motors for fluid pumping, ARC Linkage Grant with SES
- Variable speed induction motor with brushless, electronic energy recovery, ARC SPIRT Grant with Varispeed Ltd
- Optimum design and gear shift control of automatic transmissions, ARC SPIRT Grant with BTR
- Cooling tower research, ARC SPIRT with & Delta Electricity
- Dynamic analysis and testing of a blood pump rotor, ARC SPIRT/APAI Grant
- Effects of frequency of electric fields on boiling heat transfer, ARC Small Grant
- High performance low cost electric motors using soft magnetic composite materials, ARC Small Grant
- 30kW Transverse Flux Wind Turbine Generator, Australian CRC for Renewable Energy (ACRE)
- Low cost AC motor drives, ACRE
- Magnetic components, ACRE
- Low cost SR motor drive, ACRE
- 20 kW direct drive PM wind turbine generator, ACRE Project with Westwind Ltd
- High temperature super-conducting (HTS) wind turbine generator – Pre-feasibility study, ACRE Project with IRL, New Zealand
- Mobile fuel cell system, ACRE & UTS
- Dynamic modelling of PEM fuel cells with variable loads, ATN Grant
- Efficient variable speed drives for home cooling and swimming pool applications, AGO & ACRE
- PM motor for marine drive systems, Solar Sailor Holdings Ltd
- Rotatory blood pump, VentrAssist Ltd
- Implantable peri-aortic counterpulsation heart assistance device, Sunshine Heart Ltd
- Sensorless controller for high speed air condition-ing motor, Turbo Research Ltd
- High power cycloconverter ball mill drive, Highland Valley Copper Mine, Canada

CONTACT DETAILS

Prof. J.G. Zhu
Faculty of Engineering, University of Technology, Sydney, PO Box 123
Broadway, NSW 2007, Australia
Telephone: +61 2 9514 2318
Fax: +61 2 9514 2435
Email: joe@eng.uts.edu.au
Web: www.eng.uts.edu.au/CEMPE