

Electrical and Computer Systems Engineering



The Department of Electrical and Computer Systems Engineering has established an international reputation for research and development, especially in biomedical, computer systems, control, power and telecommunication engineering.

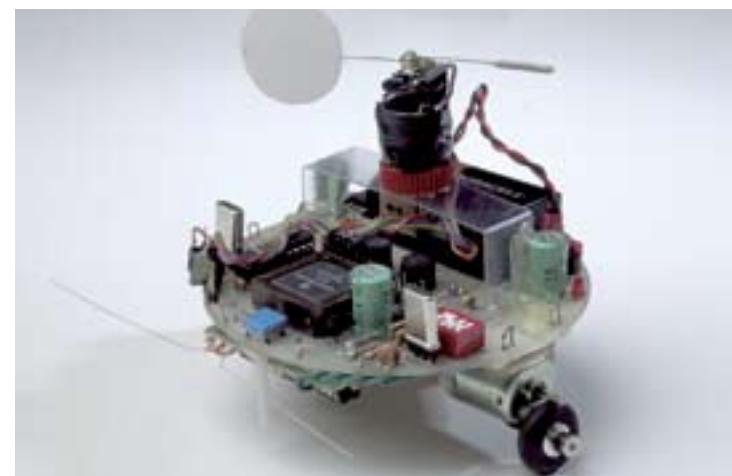
Its researchers are developing simulated reality techniques to help train surgeons, creating robotic systems to work in dangerous environments, and improving the speed and ease with which we communicate.

Biomedical Engineering

The department's biomedical group, including the Monash University Centre for Biomedical Engineering, undertakes a range of research, teaches specialist subjects to biomedical engineering students, and consults widely to the health industry.

One of the centre's major research initiatives is the use of simulated reality in the training of surgeons. Other research areas include muscle mechanics, muscle injury, movement and proprioception, functional neuromuscular stimulation, and the investigation of prosthetics and orthotics, conducted through RehabTech, a research and consulting centre funded by several state governments.

In all of its research, teaching and consulting, MUCBE collaborates with Monash University's Physiology Department and the engineering, medical and physiotherapy groups in the university's teaching hospitals.



Computing and Robotics

The computer group, including the Intelligent Robotics Research Centre, concentrates not only on computers as parts of engineering systems, such as control systems in aircraft, but also on robotics, one of the international strengths of Monash University.

IRRC research includes pattern recognition, computer vision, optical flow, ultrasonic sensing, tactile and olfactory sensing, robotic hand-eye

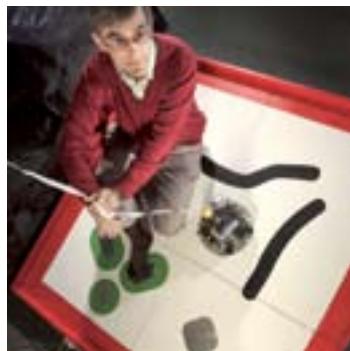
coordination, mobile robot navigation and interactive computer graphics.

The IRRC, a node of the ARC Centre for Perceptive and Intelligent Machines in Complex Environments, has amassed significant experience in microcomputer systems, parallel computer architecture, VLSI design, electronics, control systems, communications, genetic algorithms, expert systems, and artificial intelligence methodologies including fuzzy and neural systems.



Electrical Power

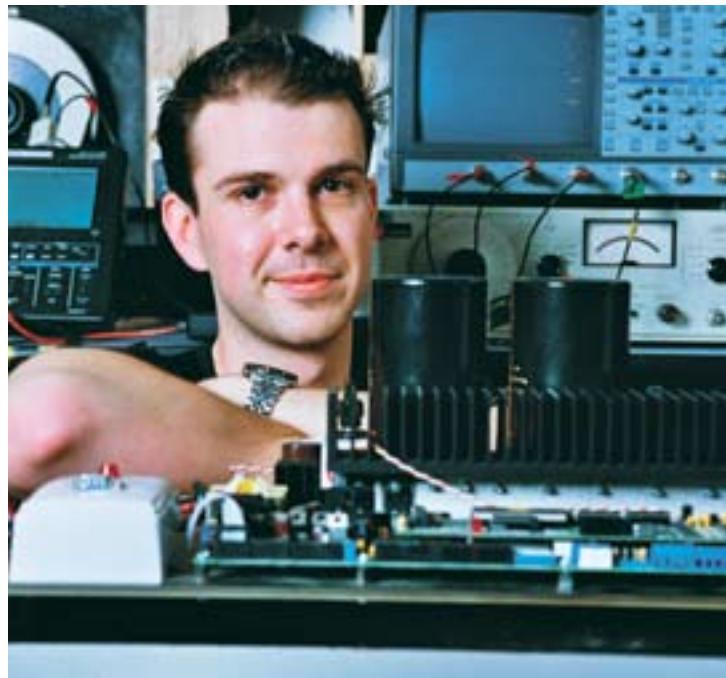
The power group at Monash conducts research into power systems, power electronics, high voltage systems, solar photovoltaic systems and the monitoring of transformer life. Ongoing grants from the Electrical Power Research Institute in the USA, and new support from the local transformer industry and the Victorian state government, will support the creation of a new Centre for Power Transformer Monitoring, Diagnostics and Life Management, including of a new research facility that will provide a unique research capability to study transformer insulation behaviour under various operational conditions. The centre will support laboratory, factory and field research and development activities to help the development of advanced insulation systems to extend their life, performance and safety. It will also help maintain Australian leadership in high-voltage asset management, and in condition-based maintenance technologies.



Telecommunications

The telecommunications group including the Centre for Telecommunications and Information Engineering at Monash covers the rapidly merging worlds of telephony, radio and computer communications.

The CTIE, founded originally under funding from Telstra, conducts world-class research into optical fibre communications, antennae, electromagnetic compatibility (EMC), ionospheric radio propagation, video compression and restoration,



internet, network simulation and cluster computing, wireless and advanced non-proprietary networks, particularly for video communications.

The centre provides consulting services on high-performance network design, ranging from the LAN and WAN networks for the Museum Victoria to a whole-of-country internet for Iran.

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