DE MONTFORT UNIVERSITY LEICESTER

YOUR CHALLENGES + OUR EXPERTISE = INNOVATIVE SOLUTIONS

Working with Technology at De Montfort University

ADD DMU. PROFIT FROM OUR EXPERTISE

De Montfort University

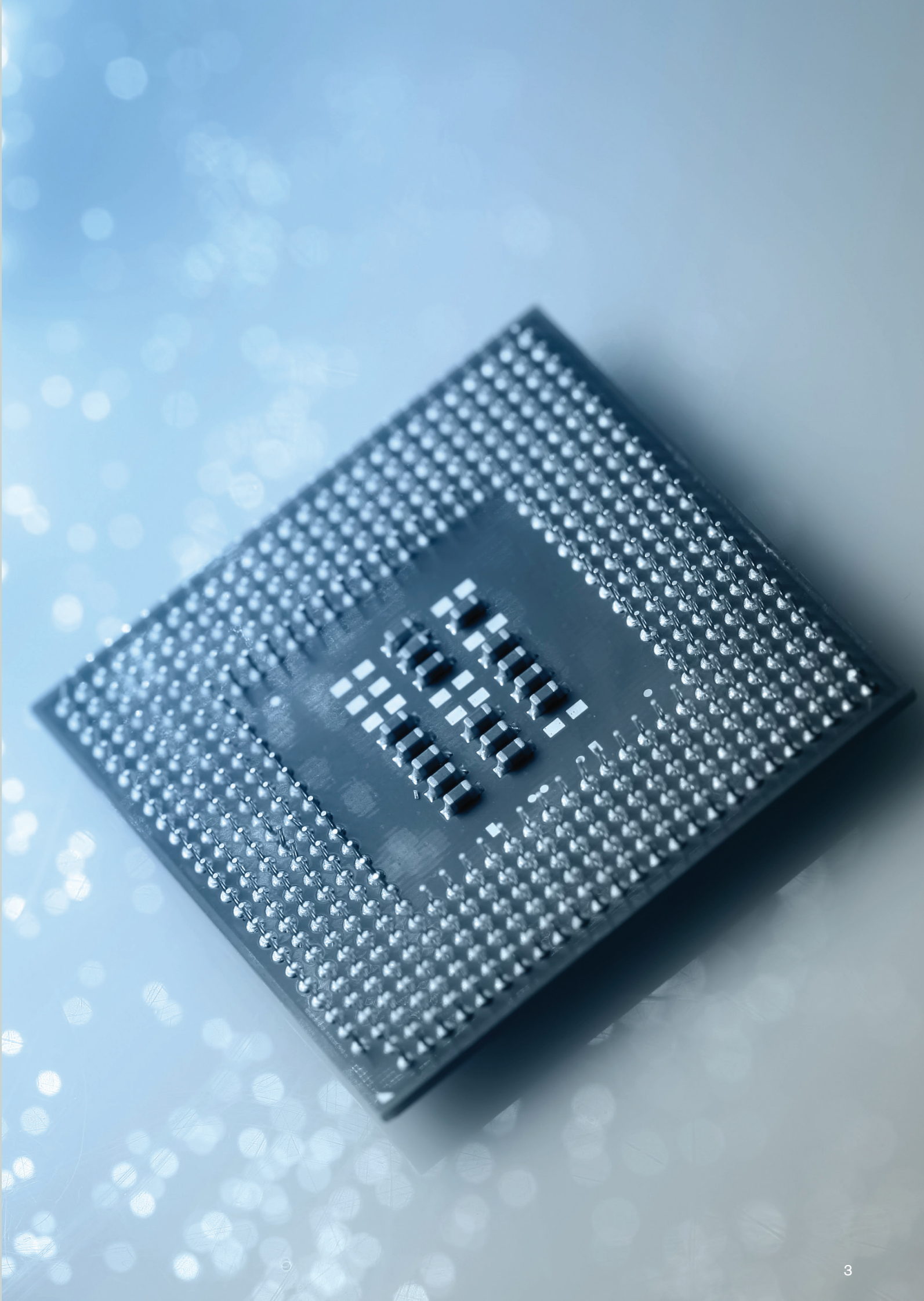
De Montfort University (DMU) is an ambitious university: for more than 100 years our pioneering outlook has enabled us to build dynamic links with local and international businesses and to introduce innovations that improve the way they work.

Within both Leicester and the East Midlands region DMU is highly influential, nurturing strong relationships and working in partnership with individuals and organisations across the widest range of cultural, political, economic and social fields.

Technology, innovation, sustainability and world class research are at the heart of De Montfort University. We pride ourselves on the development of our learning environment, bringing you the very latest ideas and techniques via cutting-edge research, innovative state-of-the-art facilities and ongoing collaborations with commercial organisations and industry specialists.

Expertise in Technology spans a variety of focused research groups, which bring together academics with similar skills and special interest groups that act as catalysts for interdisciplinary research. Strong links with commerce ensure research is geared towards real-life challenges. Projects cover subjects as diverse as medical diagnostics, robotics, satellite mapping, home security, 3D television, aircraft manufacturing and safety, mobile communications, sustainable buildings and alternative energy.

With this rich complement of expertise we look to create favourable partnerships with industry to enable technology, innovation and research to flourish for the future.



Working with DMU

Our technological expertise can help you explore new ideas, develop practical solutions and implement new ways of working.

Working with industry

We offer services including:

Consultancy

Contract research

Collaborative research

- Technology Strategy Board
- Knowledge Transfer Partnership Scheme
- European Union Framework Programme Seven

Training

- Bespoke training programmes
- Accredited professional training courses
- Non-accredited professional short courses

Student placements

Our areas of expertise include:

Computing

Electronics

Product design and development

Manufacturing

Mathematical sciences

Mechanical engineering

ICT

Media technology

Energy and sustainable development

Consultancy

Our services allow you to access internationally recognised consultancy expertise based on our research and facilities in computer technology, engineering, informatics and media technology, where you may have little or no resource.

We have a track record of delivering to our customers' specifications on time and within budget, and are flexible and responsive to your business needs. Our consultancy expertise covers many areas across both private and public sector organisations, all designed to benefit you. We adopt a multidisciplinary approach, using the complementary expertise available within the university to address real-world problems.

Contract research

Commissioning contract research is a flexible and very effective way to investigate issues relevant to your business. Our broad range of expertise and resources allows us to undertake research in a range of different areas, work which has proven invaluable to many commercial organisations in areas as diverse as robotics, satellite mapping, home security, 3D television, mobile communications and alternative energy.

Collaborative research

We engage in collaborative research in a number of ways.

— **The Technology Strategy Board (TSB)**
The TSB stimulates technology-enabled innovation in areas that offer the greatest scope for boosting UK growth and productivity. It invests in projects involving business and researchers working together to deliver successful new technology-based products and services, specifically in the areas of science, engineering and technology. We have engaged in a number of TSB-funded collaborative projects covering assisted living innovation, laser printed electronics, building retrofit and improving customer demand and cost forecasting methods.

— **The Knowledge Transfer Partnerships scheme (KTP)**
One of the most successful forms of collaboration is through the KTP scheme which is also funded by the TSB. This enables businesses to access higher education resources and expertise and apply them to strategic projects, stimulating innovation, expansion and performance improvements.

KTPs are a three-way partnership between your company, the university and a KTP associate. In conjunction with us, you will define the strategic objectives and challenges for which KTP support is required. This will inform the person specification for the KTP associate, a recently qualified graduate in the specific area targeted, who we will recruit and employ. The associate will typically work for you for two years to deliver the strategic project, supported by one of our academic consultants. There are many benefits of engaging in a KTP, for more information email tech-development@dmu.ac.uk

— **Framework Programme Seven (FP7)**
EU-funded FP7 research activities aim to strengthen Europe's science and technology base. This is to ensure its global leadership in a range of themes including, Energy, Environment and climate, ICT, Industry and Industrial and Transport. Each of these research activities help to drive and stimulate product, service and process innovation and creativity to ensure that progress is rapidly transformed into benefits for Europe's citizens, businesses, industry and governments. The Faculty of Technology has received FP7 funding for collaborative research projects including ethical issues of emerging ICT applications, personalised health monitoring, flight simulators that simulate dangerous conditions, knowledge, awareness and prediction of man machine material and method in manufacturing and interactive 3DTV systems.

Training

We all know that the professional development of staff is important to retain and develop your workforce effectively, but not everyone knows which course would be best for their business. This is where we come in. We can develop bespoke training courses for you, or you can choose from our range of accredited professional training or non-accredited professional short courses – it depends on your requirements.

— **Bespoke training:**
Meeting your organisational needs
As one of the largest centres for advanced technology education in Europe, we offer high level training across a range of computing and engineering disciplines. We can develop tailored packages which meet your needs.

Examples of recent training programmes include the following:

- Implementation support for LEAN manufacturing and operations
- Mentoring IT staff in a high tech manufacturing company through a major product development programme
- Rapid prototyping/manufacture
- Object-oriented analysis and design
- C++ programming
- UML 2.0 for software development
- Specification and design for component-based development
- Software architecture
- Software engineering
- Requirements engineering

— **Accredited professional training courses**
Our strength in education benefits a wide range of industries. We can help you drive your workforce, and ultimately your organisation, forwards. Accredited courses can contribute towards a University Certificate in Professional Development (UCPD), which can then count as part of a full degree. We offer courses ranging from Basic Website Design to Advanced Skills in Adobe Illustrator and Photoshop.

— **Non-accredited professional short courses**
Our short courses run through the year and have been designed to support skill development. Your staff gain new expertise and grow in confidence, benefiting your company as well as your staff. Courses include software, gaming and agile development with LEGO® MINDSTORMS® robots. For further information on all accredited and non-accredited courses please email tech-development@dmu.ac.uk

Student placements

We offer all our undergraduate and postgraduate degree students the opportunity to undertake a 12 month industry placement. Companies who offer placements benefit immensely from their experience.

- Our placement students have sound knowledge of their subject areas and are enthusiastic to gain experience, so can provide you with a fresh input of ideas and skills
- Exceptional value from students who do a real job totally under your control; there are no long-term overheads as the commitment is for one year only
- Increased business flexibility with additional staff cover at critical times to help with a specific project or in a department
- The opportunity to develop links with the university, which may be useful in other areas
- Recruitment is quick, inexpensive and professionally supported by our Placement Unit
- A cost-effective graduate recruitment tool, allowing you to trial a student for a year with a view to providing permanent employment after graduation

Our students undertake their work placements everywhere from small local businesses to large multinational corporations. We are always happy to discuss opportunities with new companies. If you are interested in offering a placement or you would like further information our Placement Unit can advise and support you throughout the process.

Email them: placementunittech@dmu.ac.uk

Why DMU is a good business partner

Independence

Flexible approach

Client focus

Broad range of capabilities

Leading-edge expertise

Access to enabling funds from third parties e.g. EU, DBIS

The range of companies we work with

Architecture:
Australia Stadium (Australia), New York Times Building (USA), John Ruskin Museum and Archive, Harm A. Weber Library, Judson College, near Chicago (Illinois), Low-energy demonstration building, Hangzhou (China)

Automotive:
Ford, Peugeot, Toyota

Manufacturing:
Airbus, BAE Systems, Bridgeport, Brand-Rex, CAT, IBM, Panasonic, Preactor International Ltd, Rolls-Royce, Samsung, Sharp, Simco Industries, Sony, Trelleborg, Unipart

Public Sector:
BBC, Department of Health, Leicester City Council, MOD Defence Technology Centre, QinetiQ

Space:
European Space Agency

Telecoms:
Nokia, Orange

Utilities:
Advantica, Anglian Water, Centrica, E.ON, Honeywell, Severn Trent Water

Technology: Areas of expertise

The faculty consists of four departments. The departments of **Engineering** and **Media Technology** focus on micro-electronics and electronics, imaging technologies, communications, water control software, mechatronics, mechanical engineering, multimedia, media production and manufacture. The departments of **Informatics** and **Computer Technology** are concerned with research in computational intelligence, interactive media, software engineering, satellite remote sensing, computer security and computing and social responsibility. The Institute of Energy and Sustainable Development joined the Faculty in 2011, and carries out research into more energy-efficient and sustainable lifestyles, particularly regarding the built environment.

Engineering

From mechanical engineering, nanotechnology through to rapid prototyping, our engineering research groups combine academic and industry expertise with the latest technologies. Our researchers are continually looking to develop new products, methods and processes, all aimed at improving industrial techniques and increasing efficiency.

Engineering facilities

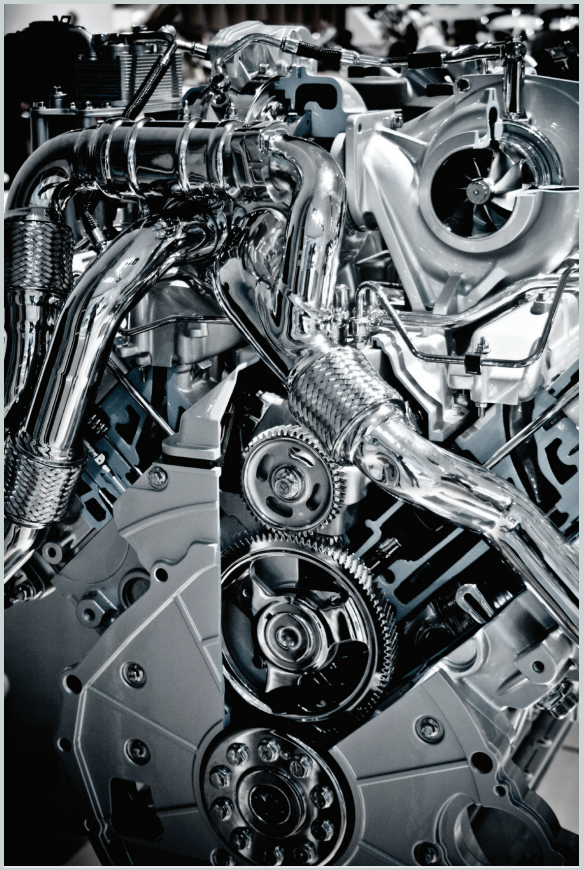
The engineering laboratories bring together a wide range of equipment in two dedicated mechanical and electronic engineering areas. These are extensively used for design, manufacture, prototyping and testing. The electronic areas include analogue electronics, digital electronics, embedded systems and advanced communication, while the mechanical areas include a wind tunnel, an engine test bed and computer numerical control machining.

There are currently eight main areas of focus within the Department of Engineering, each responding to different challenges in society or industry:

— **Water Software Systems (WSS)**
Specialists in computer modelling of water distribution systems and waste water management.

This group provides consultancy and research services. Its members are pioneers of computer modelling in water distribution networks in Britain. Their expertise has been applied to:

- Energy and pressure management
- Burst detection and leakage control
- Network design



— Additive Manufacturing Technology (AMTG)
Delivering effective solutions in manufacturing prototypes.

This group specialises in manufacturing solid 3D objects directly from computer-aided design data; allowing complex objects of almost unlimited complexity to be manufactured. Their extensive range of machines, which process plastics, metals and ceramics, can produce both prototype and production parts, contact and non-contact scanning, reverse engineering and material testing. Key areas of research include:

- Application of rapid prototyping and associated techniques (rapid tooling, reverse engineering, high speed machining etc) to reduce product development lead-times and cost
- Rapid manufacturing of high volume components using a combination of layer manufacturing and high speed printing technology
- Application of advanced manufacturing and engineering techniques in the field of surgery

— Lean Engineering (LERG)
Operations efficiency for the manufacturing, healthcare, logistics, distribution and process industries.

This group focuses on developing strong technical partnerships with manufacturing and service industries, using lean practices and artificial intelligence technologies to improve manufacturing environments in terms of responsiveness, flexibility, productivity, reliability and cost effectiveness. The main areas of research include:

- Operations design, planning, scheduling and control of complex work environments
- Implementing lean and Six Sigma improvement practices
- Demand forecasting, cost modelling and carbon emissions estimating

— Mechanical Engineering (MERG)
Mechanical and aeronautical engineering experts.

The Mechanical Engineering Research Group conducts research and provides business consultancy in a number of areas within the mechanical and aeronautical engineering sectors. The group's expertise has been successfully applied to many scientific and engineering problems both in academic and industrial application domains. Key research areas include:

- Combustion modelling and internal combustion engine research
- Material science and surface engineering
- Computational fluid dynamics (CFD) or Newtonian and non-Newtonian flows
- Aerodynamics and flight mechanics
- Surface engineering and tribology

— **Mechatronics (MRC)**
Innovative mechanical, electronic and software engineering.

This group conducts high quality research within the integrated disciplines of mechanical, electronic and software engineering. The centre has research and development capabilities in:

- E-Home technologies and services and smart-home technologies
- Distributed control network technologies
- Smart actuators and sensory systems design
- System modelling and simulation
- Virtual engineering (digital manufacturing)
- Control systems design, data acquisition and telemetry
- Information management systems design and implementation
- Internet-based technologies
- Robotics and automation
- Advanced pneumatic servo-actuator systems design

— **Emerging Technologies Research Centre (EMTERC)**
Micro and nano electronic solutions for the energy, health, nano science and technology industries.

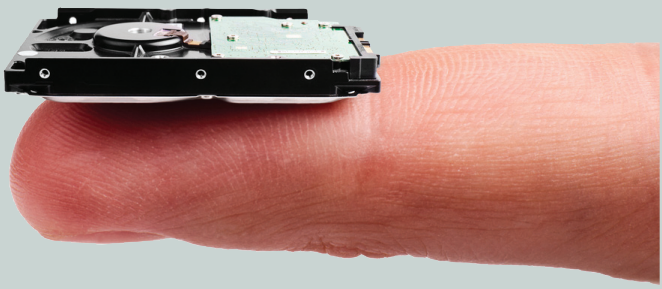
Internationally renowned as a centre of excellence in micro and nano electronics, the group conducts research on fabricating new, more efficient materials and finding applications for them based upon their physical mechanisms. Key research themes include:

- Energy (photovoltaics, power electronic devices, etc)
- Healthcare
- Organic electronics
- Low temperature large area electronics
- Printable and flexible electronics
- Electronic memory devices
- Nano materials and devices

— **Centre for Electronic and Communications Engineering (CECE)**
Offering technological solutions and multimedia techniques for electronics, communications, healthcare and entertainment.

The Centre for Electronic and Communications Engineering (CECE) spans a wide range of diverse areas ranging from semiconductor physics to signal processing. The Centre aims to deliver pure and applied research to satisfy both fundamental research and industry specific (to market ready) knowledge transfer. Key areas of expertise include:

- Semiconductor device characterisation (includes infra-red thermal microscopy)
- Microwave design
- Electromagnetic compatibility
- Computational and experimental electromagnetics
- Power supply design
- Power systems analysis
- Error control coding
- Video communication systems
- Digital broadcast systems
- Image and video compression
- Metadata insertion and multimedia content analysis
- Development of digital media products for the enhancement of the human condition



Media Technology

Media Technology explores the technical applications of different media. From developing visualisation environments through interactive 3D graphics to e-learning, we aim to help enterprises succeed in the digital economy by developing innovative products and solutions that enhance people's lives and surrounding environments.

Media Technology facilities

Our multi-million pound Creative Technology Studios boast an overwhelming range of industry-standard equipment. We have High Definition (HD) work stations, television studios with HD video cameras, green screen and virtual-studio capabilities; two fully-equipped recording studios featuring analogue and digital recording systems; surround sound monitoring and a fused-media and motion-capture studio used for 3D image capture, modelling and display.

– **Fused Media**
Technologies that can support the creative, digital media, entertainment, gaming and health markets.

This laboratory develops and exploits new technologies to enhance cost-effectiveness and creativity in media production and visualisation processes. Important activities include the development of visualisation environments for rapid prototyping, inter-aware realities, an interactive virtual studio, interactive 3D graphics, games technology, media security and media distribution. Key areas of expertise include:

- Haptic devices: tactile feedback technology that takes advantage of a user's sense of touch by applying forces, vibrations, or motions to the user
- 3D visualisation and stereoscopic capture and display
- Motion tracking
- Augmented reality
- Virtual studio

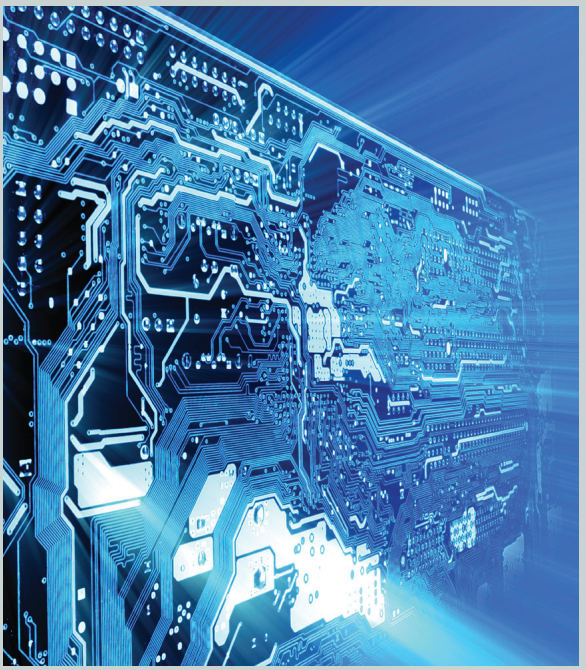
– **Innovative Interactive Systems (IIS)**
Solutions for online interactive systems.

The Innovative Interactive Systems Research Group produces empirically designed guidelines for the design and development of systems. Offering services to a range of sectors, including education, training and development and the creative industries, the group has expertise in areas such as:

- E-learning
- Multimodal and multimedia systems
- Interactive auditory interfaces
- Internet-based e-commerce systems
- Interfaces for software engineering
- Interactive computing and media technologies

Computer Technology

From our collaborative work with space agencies to glasses-free 3D viewing, our Computer Technology research groups combine world-leading expertise with the latest technology and equipment to develop cutting-edge solutions.



Computer Technology facilities

We have a number of high-spec computing labs each of which is specially customised with multiple operating systems, virtualisation and removable hard drives, plus specialised servers, wired and wireless networking equipment and a wide variety of other hardware and software components.

– **Earth and Planetary Remote Sensing Laboratory (EAPRS)**
World leaders in earth and planetary remote sensing.

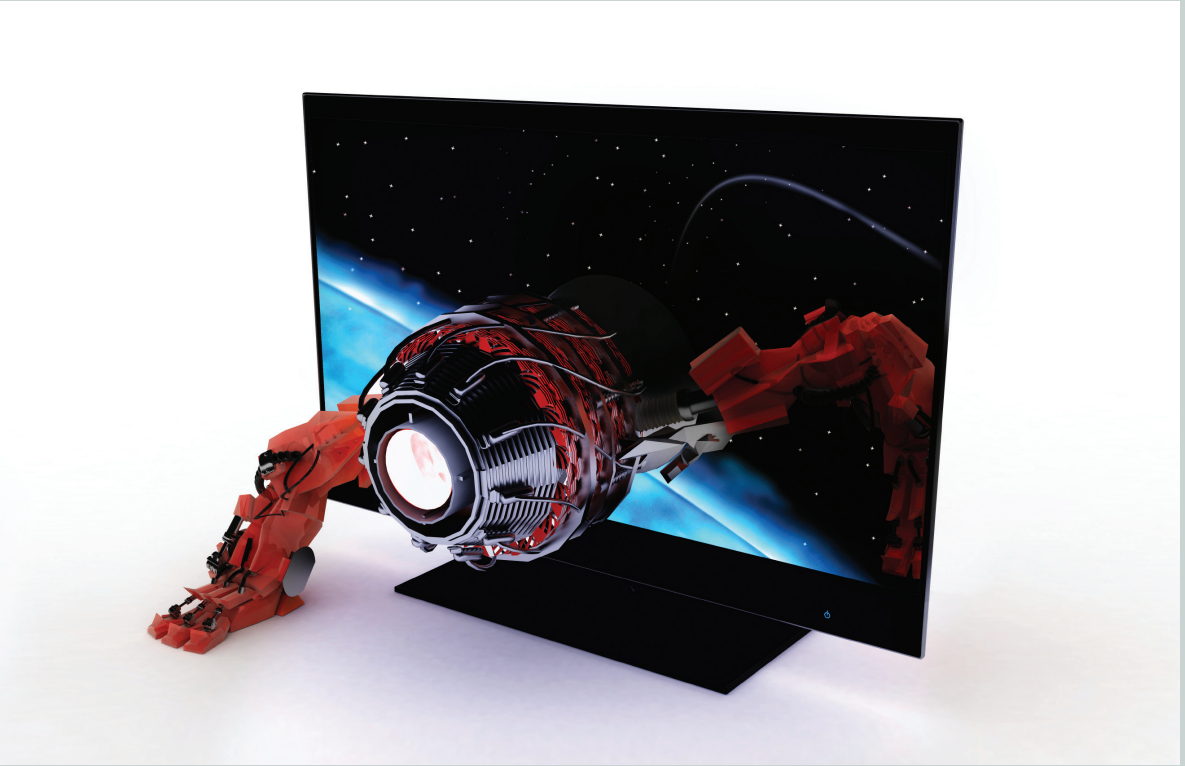
The internationally recognised EAPRS Laboratory researches both land and inland water altimetry. The current focus is the analysis and interpretation of remote sensing data, with an emphasis on radar instruments, particularly Satellite Radar Altimetry, which has been used by the European Space Agency (ESA).

The group has developed strong links with the space industry and secured contracts to demanding specifications with ESA and other space related companies; EAPRS places a strong emphasis on collaborative research programmes and has the expertise and experience to work on large contracts.

– **Centre for Secure Computing (CSC)**
Experts in computer forensics and security, targeting the law enforcement and supportive industries.

With leading academics and industry experts, the Centre for Secure Computing focuses on a wide variety of computer forensics and security issues. From the highly theoretical to the immediately practical, the work of the group combines a thorough understanding of the real-world digital environment with deep insights into its underlying theoretical foundations. The centre offers services to those working in the security technology and service sectors, including law enforcement and supportive industries, government and other public sector organisations. Areas of expertise include:

- Data recovery, e-discovery and other compliance requirements
- Information assurance and digital forensics advice and services
- Policy formulation
- Technological innovation
- Training in all aspects of cyber security and digital forensics



— **Imaging and Displays (IDRG)**
Leading the way forward in 3D display.

This is one of Europe's leading 3D display research groups, earning an international reputation for excellence in the design, development and evaluation of next-generation 3D displays for consumer and industrial use. The team's world-first projects regularly involve collaboration with partners worldwide, opening up new possibilities for innovative displays and greater interaction. Key areas of research include:

- 3D display systems
- Auto stereoscopic displays
- Computer graphics
- Virtual reality
- Telepresence and interaction with 3D displays
- Viewer tracking and eye tracking

— **Software Technology Research Laboratory (STRL)**
Developing software systems for IT businesses worldwide.

The Software Technology Research Laboratory (STRL) undertakes work that aims to study, analyse and advance formal approaches to the specification, design and the evolution of computing systems with emphasis being placed on those which are used in critical applications. Key areas of expertise include:

- Theoretical foundation
- Software evolution
- Service-based computing and semantic web
- Critical systems:
  - Computer security
  - Hardware/software co-design
  - Aerospace systems: flight clearance
- Software architecture and design patterns
- Optimisation and scheduling

Informatics

The Department of Informatics is very active in working with industry, with world leading research in Computational Intelligence and Socially Responsible Computing; key areas of specialism include Computing in a Business environment, Artificial Intelligence and Robotics, and Computer Games Programming.

Informatics facilities

In addition to our computing labs we have specialised games labs, which have some of the most up-to-date facilities. They bring together the latest technology for playing and developing games with open source software, the next generation of consoles and a virtual reality suite. We also have an advanced mobile robotics and intelligent agents laboratory which contains a variety of mobile robots ranging from LEGO® MINDSTORMS® to a Wheelbarrow robot for bomb disposal.

— **Centre for Computational Intelligence (CCI)**
Inventing and exploiting computational intelligence techniques to address organisational issues.

This centre produces high quality, industrially relevant research into intelligent systems, providing theoretically sound solutions to real-world decision-making and prediction problems. With an established international reputation, its work focuses on:

- Bespoke embedded hardware and software solutions
- Crowd models and simulations
- Intelligent systems for video games
- Intelligent web systems
- Supply chain modelling
- Video analytics
- Intelligent Transport Systems
- Eye Gaze

— **Centre for Computing and Social Responsibility (CCSR)**
Specialising in the ethics of emerging technologies.

Taking an interdisciplinary approach the centre has gained an impressive reputation as a key player in the international research network for the ethical and social implications of ICT. The only research centre in the UK specialising in the ethical and social issues of computing and information systems, it offers organisations independent advice that complements and enhances in-house expertise on:

- Privacy and data protection (experience in conducting Privacy Impact Assessments)
- Information and computer ethics
- Social impact of ICT
- Technology assessments
- Professionalism

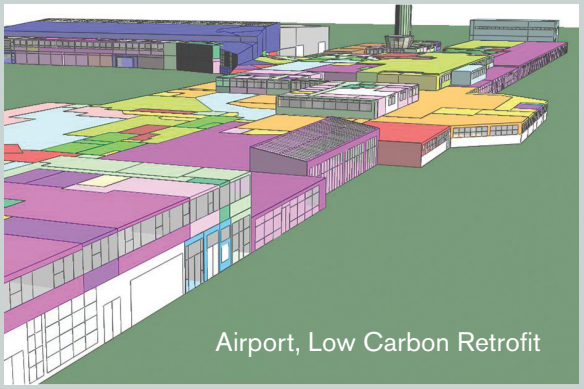
Institute of Energy and Sustainable Development

Internationally recognised experts in energy and sustainable development.

The Institute of Energy and Sustainable Development (IESD) focuses on improving the environment in and around buildings through the application of computer modelling and performance monitoring, behaviour studies, and the development of energy and environmental policies for a low-carbon future. IESD's activities respond directly to the world-wide concerns about global warming, energy supply and security and social equity.

The Institute specialises in research and consultancy which aims to make a worthwhile and significant contribution to sustainable development. The Institute's work focuses on the clean, efficient use of energy in the built environment and developing ways in which greater use can be made of renewable energy in domestic buildings, industry and commerce. Areas of expertise include:

- Innovative environmental design concepts for buildings and low energy systems
- Advice on building-integrated low and zero-carbon technologies
- Analysis of building performance through simulation and monitoring
- Advanced daylighting assessment of innovative and light sensitive facilities
- Detailed fluid dynamic analysis of air flows within and around buildings
- Building occupancy surveys , and occupant interaction with tech
- Climate and sustainability policy development
- Smart grids and community energy/carbon flow analysis
- Innovative public engagement, how we move to a low carbon society
- Visualising energy
- Training and education



Airport, Low Carbon Retrofit

Contact details

We would welcome the opportunity to discuss our expertise and how it can benefit your business. We are happy to talk through your requirements and come up with a solution tailored to meet your business needs.

For more information or to arrange a visit, please contact us.

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