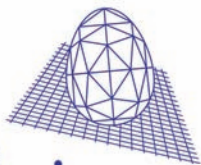


Scotland's University Research

Pioneering the future of
Wireless & Mobile
Communication



WIRELESS
innovation



SCOTTISH
DEVELOPMENT INTERNATIONAL

Scotland's University Research

Pioneering the future of Wireless & Mobile Communications

Intelligence that's changing the world

Scottish Universities are at the forefront of education and research in mobile and wireless technologies as well as mobile applications. Our energetic research culture provides Scotland with a genuine centre of excellence for Innovation and is one of the most vibrant and exciting locations in Europe in which to work.

Scotland has a long standing reputation for high quality higher education and Scotland's colleges and universities offer a range of joint research, training and technology transfer programmes specifically to provide the skills to fuel the burgeoning wireless and mobile digital economy.

Many of Scotland's Education establishments have emerged as internationally leading centres for mobile & wireless technologies. The transfer of fundamental research in to real economic value is a key focus for Scotland.

But it's not just quantity, the quality of university research and teaching is one of the key strengths of the Scottish economy.

The following statistics¹ illustrate the disproportionate contribution made by Scottish universities to the UK total:

16% of academic departments are ranked 4, 5 or 5* in the Research Assessment Exercise (RAE)
1% of all research publications in the world - ranking Scotland 3rd in the world
12% of total UK funding council resources for research
12% of EU research funding spent in the UK

As a nation we continue to create a hotbed of research talent, pushing forward with innovation. With industry sectors from digital media to intelligent transport and communications, there is a buzz around the electronics industry in Scotland. You can join this thriving community with our help and support.

Research Institutes

Scotland has several research institutes, including ITI Techmedia which identifies market opportunities then develops and manages a portfolio of cutting-edge intellectual property in the global market for digital media and communications technologies.

ITI Techmedia

www.ititechmedia.com

With a budget of \$300M over the next ten years ITI Techmedia current projects include a new application development platform that will simplify the creation of learning modules in the emerging market for Games-based Learning as well as research into Ultra-Wideband wireless communication, Machine-readable Security Tagging and Online Games Development.

Kelvin Institute

www.kelvininstitute.com

The Kelvin Institute identifies current research programs that have strong commercial potential and brings research teams to the Institute to work with in house teams. New products are then licensed to existing enterprises and/or spun out into new companies which take their innovations to market.

¹ (Source - Scottish Enterprise.)

International Collaboration

Many of Scotland's research establishments have emerged as internationally leading centres for mobile & wireless technology research. These renowned University research groups, including amongst others Strathclyde, Edinburgh, Glasgow, Heriot-Watt and Abertay, have developed strong research ties with industry leading players.

Some of the international companies that have taken advantage of this research include Benq Mobile, Philips, Wavetrend, Agilent Technologies, Freescale, Samsung and Motorola TTPCom.

Research Group Case Studies

The following are examples of some of the world class research groups within Scottish universities. These groups are led by internationally recognised academic experts.

University of Edinburgh

www.ed.ac.uk and www.mobilevce.com

- The Signals and Systems group has contracts from Samsung and Toshiba to study the developments of radio resource management and increased capacity in future wireless local area networks.
- The Next Generation Wireless Network and the Virtual Centre of Excellence in mobile communications is developing multi-mode and multi-standard handset algorithms and personal distributed environments.
- The School of Informatics is one of the top five centres in the world for research and teaching in computation, information and cognition.
- The Edinburgh-Stanford University Link is focused on technology transfer and economic development links

University of Strathclyde

www.strath.ac.uk and www.mobilevce.com

- Highest rated Electronic and Electrical department in Scotland as well as being in the top five UK Universities for research and teaching
- The Mobile Systems Group research is closely linked to the evolution of multimedia, third generation digital systems, and the development of highly efficient algorithms to make maximum use of restricted resources.
- The Pervasive and Global Computing Group is researching the potential created by the combination of the advances in wireless networking and mobile devices, resulting in a widely available global network of inexpensive devices which are radically different from the traditional computer

Commercialisation of Research

Scotland's University research and commercialisation departments have made considerable success in commercialising of its research. The following are examples that have been successful:

Mobile Acuity Limited – University of Edinburgh

Contact: Anthony Ashbrook
www.mobileacuity.com

Embedded camera phones have been one of the biggest success stories in recent years with most phones sold today having a good quality camera built-in. It's predicted that by the end of this decade over 90% of phones being used will have a camera.

Yet despite this rapid adoption, so far there has not been a huge amount of creativity around tapping into the capability of these devices.

Now Mobile Acuity (formerly Spellbinder), a new company created from a Proof Of Concept project at Edinburgh University's School of Informatics, believe they have a compelling new application which will drive usage of camera phones in new and innovative ways.

Mobile Acuity allows mobile users to interact with traditional media and real objects using their camera phones. "The Mobile Acuity concept is relatively simple," said Anthony Ashbrook Senior Research Fellow, Mobile Acuity Project. "Mobile Acuity essentially pushes specific content to your phone if you take and send a picture of a known target object. The target object can be anything from an advert in a newspaper or magazine, a label on a bottle of beer to an information sign at a tourist attraction".

"Mobile Acuity looks at the received picture using the technology we have developed and can determine if the object matches an image we have in the database. The application is very sophisticated in determining if there is a matching image. Based on the type of application we are hosting, we can send the right content based on what the user has sent.

3Motion – Glasgow School of Art

Contact: Martyn Horner
www.gsa.ac.uk/dds

The 3Motion project was started some three years ago at the Digital Design Studio of the Glasgow School of Art (GSA), and assisted by the Scottish Enterprise "Proof of Concept" project. GSA has a well-deserved reputation for the education and generous provisioning of 'real' artists but they also do research and commercial work in the general areas of visualisation and interface design, as well as running an arts-oriented MPhil animation course.

The 3Motion project was such a research project, aimed at finding a new approach to interacting with rich graphical environments – virtual reality, visualised data universes, complex designs – and, indeed, as it turned out, games. The combination of hardware and software is all parcelled up in the patented 3Motion package but, recombined in different forms, there are many other opportunities.

An example has been built as a games controller into a small box about the size of a mobile phone incorporating a set of batteries and a Bluetooth connection. The interesting bit is the tiny 3Motion sensor. With a Bluetooth equipped PC and receiving software, you have a device sensitive to motion and to orientation. The software can recognise pre-programmed gestures made with the 3Motion controller in hand. You don't need to calibrate its location or set it up before use. You just pick it up and wave it about.

They've also put the tiny active component into a mobile phone. There it can share the power source and communication facilities of the host and can even use the phone's computing platform. You then have, with very little increase in bulk or power consumption, a phone with motion-awareness.

The 3Motion module is minuscule, it costs almost nothing and takes very little power but the device that hosts it experiences the bumps and hazards of life much as its owner does. With the cleverness of the 3Motion software - and some ingenuity - we can start to solve some real-life problems.

Support for University Technology Transfer

There are a number of organisations and funding mechanisms supported by the Scottish Executive and Scottish Enterprise which promote the commercial exploitation of Scotland's academic strengths. This includes funding and expert advice to bring new technologies developed within the universities closer to commercialisation, either through licensing or spin-out companies, and various mechanisms to support existing companies wishing to access university expertise and resources. These include the following;

Interface

- **Interface** is a central access point for industry to Scotland's university research base. We provide free information about the specialist expertise that is available at our universities.

www.interface-online.org

Kelvin Institute

- Commercialisation of IP generated by Glasgow and Strathclyde Universities and partly funded by Scottish Enterprise
- Focused mainly on micro/optoelectronics and communication

www.kelvininstitute.com

Optocap

- Initially established by Scottish Enterprise.
- Advanced packaging techniques for electronics/ optoelectronics integrated systems.

www.optocap.com

Scottish Microelectronics Centre

- Facility linked to the Institute for Integrated Micro and Nano Systems (IMNS).
- Semiconductor R&D
- University/Scottish Enterprise Collaboration

www.scotmicrocentre.co.uk

Intermediary Technology Institute (Techmedia)

- ITI Techmedia aims to bring Scotland to the forefront of the global market for digital media and communications technology. As part of ITI overall, they will invest £450m over 10 years in pre-competitive technologies.

www.ititechmedia.com

University-Technology.com

- Database of new technologies developed within the universities and which are believed to have commercial potential

www.university-technology.com

Funding

Scottish Enterprise - **schemes such as "Proof of Concept", "PoC+" and "R&D" Plus"**

www.scottish-enterprise.com

Scottish Executive – schemes such as "SCORE" and "SMART"

www.scotland.gov.uk

The Department for Trade and Industry (DTI) – schemes such as Knowledge Transfer Partnerships

www.ktponline.org.uk

Technology Transfer in Electronics and Microelectronics (TTOM)

www.ttom.org.uk

Other Agency Contacts

Scottish Development International (SDI) - Managing inward investment for companies locating and investing in Scotland

<http://www.scottishdevelopmentinternational.com>

Wireless Innovation – providing business development, market intelligence and product development support to over 130 companies developing wireless and mobile products and services across Scotland

wireless@innovationcentre.org

www.innovationcentre.org/wireless

MX Alliance – a trade association for the mobile and wireless industries, offering contact, marketing and support to the developers and end-users

www.mxalliance.org

To assist you in finding out more about Scottish University Research, please contact:

Derek Dougall

Scottish Development International

E-mail: derek.dougall@scotent.co.uk

Tel: +44 [0] 141 248 2700

Scotland's University Research