



THE UNIVERSITY *of* EDINBURGH
informatics

Postgraduate Prospectus

POST GRAD

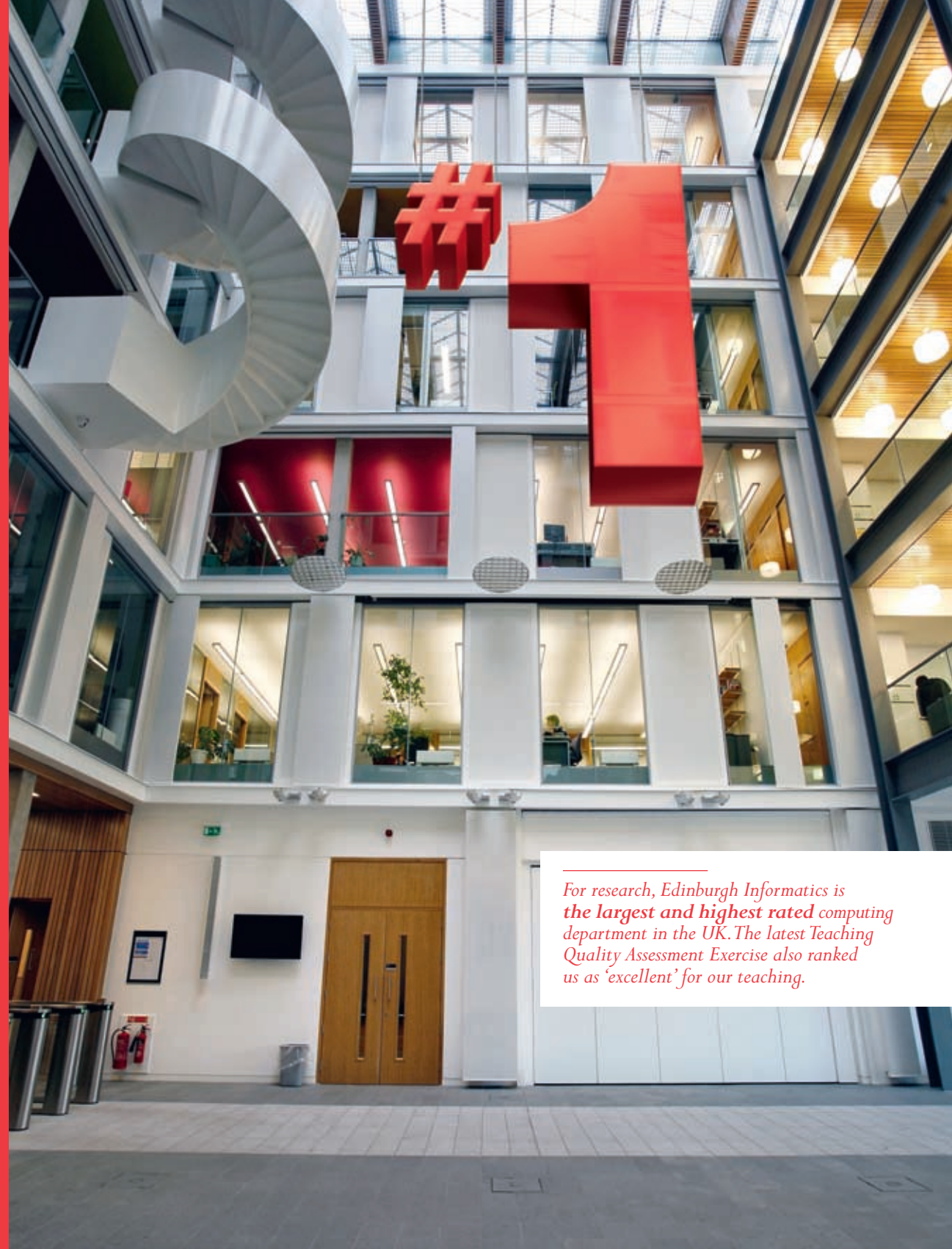


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Cover Image:

In July 2008, our new building, the Informatics Forum, opened next door to our teaching space.



For research, Edinburgh Informatics is the largest and highest rated computing department in the UK. The latest Teaching Quality Assessment Exercise also ranked us as 'excellent' for our teaching.

What is Informatics?

Informatics is the study of how natural and artificial systems store, process and communicate information.

Combining insights from Computer Science, Artificial Intelligence and Cognitive Science, Informatics studies information, computation and communication in both computer systems and natural systems such as the brain, our genes and human language. An education at Edinburgh offers you a sound foundation in the traditional subjects together with a new perspective of how to bring 'computational thinking' to a host of novel settings.

In the School of Informatics we start with a view that our subject is central to a new enlightenment in scholarship and learning. For us, informatics is critical to the development of science, technology and society. In the information age, computing technology changes how we work and play. Informatics changes the way we think.

Our school

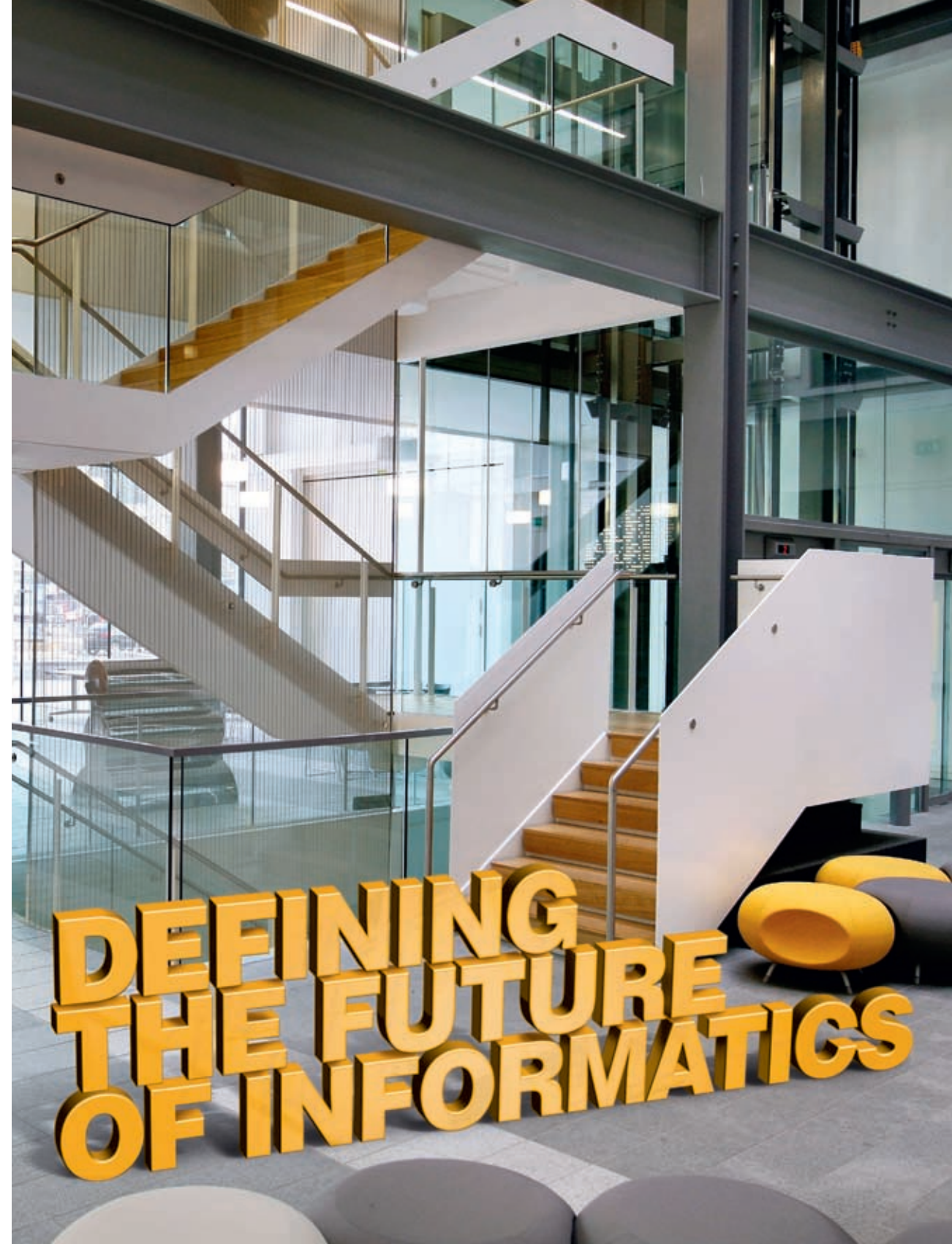
The School of Informatics at the University of Edinburgh is one of the best in the world. We have a substantial national and international reputation in both research and teaching.

For research, the school is the largest and highest rated computing department in the UK and for teaching, Edinburgh Informatics has been ranked as 'excellent' in a recent Quality Assessment Exercise.

The size of our school means that we are big enough to provide outstanding facilities for students. Our city centre premises including a newly refurbished teaching centre and a new research centre, the Informatics Forum.

Our courses

As a postgraduate student at the School of Informatics you can choose to study in a field that excites you from a wide spectrum of research areas. You will study with some of the brightest students in the world and be taught by award winning staff. More information on courses can be found on pages 8 to 15.



Studying in Edinburgh

Edinburgh is a thriving, exciting city. It is regularly voted as one of the most desirable places to live. As Scotland's capital, Edinburgh is steeped in history and tradition. Edinburgh has many landmarks such as the Castle, the Forth Rail Bridge and the National Gallery of Scotland.

Edinburgh is also renowned for its stunning Georgian architecture, winding cobbled streets and numerous open, green spaces, which all contribute to its picture-perfect beauty.

Entertainment

Edinburgh's nightlife has something for everyone. Traditional pubs or fashionable bars cater for a quiet drink or a full-on party.

If you enjoy music, Edinburgh's many venues attract live acts all year round – from stadium bands to obscure singer-songwriters.

Genuine night owls can dance the night away to a wide range of club nights – all week! Techno, house, R&B, indie and cheesy pop nights – you'll find them somewhere in the city. Then there is the city's reputation as a centre for classical music, if that is your taste.

For eating out, choose from a wide range of restaurants, serving an abundance of international cuisines and catering for all budgets. Haggis is not obligatory, but you just might acquire a taste for it!

Edinburgh also knows how to rise to a big occasion. Its famous annual Hogmanay party attracts visitors from all over the world every New Year's Eve. Festival season in August sees the Edinburgh International Festival, Festival Fringe, and International Book Festival among others. These events take over the city, attracting visitors from all over the globe. The Fringe

attracts a host of comedic talent ranging from well-known stars like Ricky Gervais and Joan Rivers, to up-and-coming comic talent.

Sport and culture

Edinburgh has many museums, galleries, libraries and theatres. Its galleries attract big-name exhibitions. Recent shows in the city have included Andy Warhol and Tracey Emin. Its museums can also provide insight into Scottish culture, past and present, as well as societies from far-flung places and distant times.

Edinburgh has hosted the Commonwealth Games and boasts a variety of top-range sporting facilities. Fancy Europe's longest dry ski slope? We've got it. Then there is the international rugby stadium at Murrayfield, an ice rink, and numerous swimming pools. We also do soccer. For those who love the outdoors, the rest of Scotland's spectacular scenery is not far to reach by road or rail.

Scotland may not be famous for cricket teams, but the Informatics Cricket Club will soon tell you that computing is not all about sitting in front of a screen.

Explore the city of Edinburgh: webcams, photographic tours, guides at www.ed.ac.uk/explore/city.



The University of Edinburgh

Consistently ranked among the best universities in the world, the University of Edinburgh is a leading international centre of academic excellence. It is one of the largest and most successful research universities in the UK.

A world-class institution for teaching and research. A member of the Russell Group of universities – often referred to as the UK’s equivalent to the American Ivy League – Edinburgh’s eminent staff and graduates have been responsible for worldwide achievements.

Astronaut Piers Sellers, Olympians Chris Hoy and Katherine Grainger, former Prime Minister Gordon Brown and former MI5 director Stella Rimington all studied at Edinburgh.

Academic staff members of Edinburgh include Professor Peter Higgs, whose Higgs-Boson particle discovery may solve some of the biggest puzzles of particle physics. Another eminent scientist, Professor Ian Wilmut, famously led the team who cloned Dolly the Sheep. Professor Tom Devine is a leading voice on Scottish history. Bill Laing took his Edinburgh degree and went on to become a corporate vice president with Microsoft.

The postgraduate experience

Informatics has over 400 postgraduate students who come from all over the world to study at our school. As a postgraduate student you can be part of a community of researchers who benefit from a dedicated graduate school support network. From social groups such as CompSOC through to regular meet-up groups like the Tech meet up, you can study at depth a subject of your choice with like minded people.

Student services and facilities

The university offers a wide range of student services and support to cater for all your academic, practical or personal needs while you study here.

IT facilities

You will have access to large, well-equipped, 24-hour computer labs within the School of Informatics. In addition, all students can use the computing facilities of the university’s central services, such as the Main Library. We also run ResNet, a residential networking system that provides telephone and internet services to most students in university accommodation.

Library

The Main Library at George Square is one of 14 libraries within the university and is also one of the largest copyright libraries in the UK.

Accommodation

If you are a new postgraduate and come from outside the EU, you are guaranteed an offer of university accommodation provided you satisfy certain conditions. We offer self catering flats, residences and couple and family accommodation across the city. We can also help you find private housing close to all main university sites.

For more information please see: www.ed.ac.uk/studying/postgraduate/accommodation



Postgraduate study

Edinburgh is one of the best informatics research centres in the world. The breadth of research in the School means that we can accommodate a vast range of research projects.

As a postgraduate student you can choose to study for a taught or research masters (MSc), a Master of Philosophy (MPhil) or a Doctor of Philosophy (PhD) in a vast array of subjects.

Join us in Edinburgh Informatics and you can study for a MSc or higher in the following areas:

- Analytical and Scientific Databases
- Bioinformatics, Systems and Synthetic Biology
- Computer Systems and Software Engineering
- Fundamentals of High Performance Computing Systems
- Geoinformatics
- Intelligent Robotics
- Knowledge Representation and Reasoning
- Learning from Data
- Music Informatics
- Natural Language and Language Engineering
- Neural Computation and Neuroinformatics
- Theoretical Computer Science

Tom Griffiths

MSc in Informatics

Tom studied for an MSc in Informatics at the University of Edinburgh and has since gone on to start multiple companies, most recently the instant fantasy sports website Fanduel.com with help from the School's commercialisation team. At the School of Informatics, Tom was able to explore his interest in machine learning and computer vision.

Kate Ho

PhD in Requirements Engineering

Kate Ho is currently finishing a PhD at the School of Informatics in requirements engineering in e-science applications and infrastructures. Kate's broad research interests include computer supported cooperative work, human computer interaction and social networks. She was attracted to study at Edinburgh first as an undergraduate, because of its reputation in research and the diverse range of subjects available. Kate has recently started a business called Interface3 which specialises in designing and developing software for multitouch devices.

Nicholas O'Shea

PhD in Software Engineering

Nicholas O'Shea joined the School of Informatics in 2002 as an undergraduate student and was awarded the Software Engineer of the Year Award 2006 for his final year project. He is now studying towards a PhD.

'I chose to stay in Edinburgh because I've had a tremendous experience during my time at the School and I would recommend it to everyone with an interest in artificial intelligence or computer science. I don't think there is another university that I would have done as well at or helped me so successfully to realise my potential.'



Taught programmes

We offer four taught Master (MSc) programmes with a flexible, modular curriculum, allowing you to tailor your masters program to your particular interests.

All successful candidates will enrol on our taught MSc programme in September. Full time students spend the first nine months participating in a series of taught modular courses, typically involving attendance at four to six lectures a week, with a range of additional tutorials and laboratory sessions dependant on your course choice.

Students spend the final three months of the course concentrating on a major individual research dissertation, supported by an academic supervisor. The final dissertation contributes towards a third of your overall degree.

The course is also available part-time, over three years.

Detailed information can be found at:
www.inf.ed.ac.uk/teaching/years/msc/index.html

Artificial Intelligence MSc

Edinburgh is the oldest centre for AI research in the UK and today is one of the best in the world.

AI research is interdisciplinary by nature and draws on neuroscience, cognitive science, linguistics, computer science, mathematics, statistics and psychology.

The emphasis is on practical techniques for the design and construction of intelligent systems, enabling graduates from this course to apply their skills in a variety of settings, from fraud detection software to specification of the telecommand system for the European Meteorological Spacecraft Control Centre.

Cognitive Science MSc

Cognitive Science studies how the mind works.

The discipline of Cognitive Science investigates human cognitive functions such as perception and action, memory and learning, language and communication, reasoning and problem solving. This makes it a versatile and intellectually stimulating subject to study.

Edinburgh has internationally recognised strengths in cognitive science, with research focusing on language and communication, robotics and learning, neural computation, and philosophy of mind.

Computer Science MSc

Computer Science is an intellectually challenging subject that underpins the core technologies of the 21st century. The scope of Computer Science ranges from the design of programming languages and algorithms, to models of computation, such as distributed, parallel and quantum computing, and the study of the limits of computation – what can we compute, what resources (time and space) are required.

The MSc in Computer Science is an advanced degree which aims to develop specialist knowledge in areas of Computer Science such as analytical and scientific databases, computer systems and theoretical computer science.

Informatics MSc

Our most popular taught MSc course, providing the widest range of choice in subjects. By studying for our masters in Informatics you can take full advantage of the fact that our research spans the entire field of Informatics, including some areas of expertise that are unique to Edinburgh such as Bioinformatics, Systems and Synthetic Biology, Intelligent Robotics and Knowledge Representation and Reasoning.

Research areas

We have seven research institutes at the University of Edinburgh, each specialising in a different area of research. As one of our students, you will be part of a small and specialised research community in your immediate area, as well as a member of the wider Informatics community.

cisa | Centre for Intelligent Systems and their Applications

At CISA researchers investigate how knowledge can be formally represented and reasoning can be automated. This is part of the foundations for the computational fabric that supports modern industry and society. It is also a major driving force for change, in areas such as multi-agent systems and reasoning on the Web. Because there is a strong interaction between theory and application, CISA covers the spectrum from abstract research using logics and theorem proving methods through to systems oriented research (via the Artificial Intelligence Applications Institute – AIAI).

www.cisa.inf.ed.ac.uk

iccs | Institute for Communicating and Collaborative Systems

The ICCS carries out research into communication and the nature of communication, firstly among humans and secondly among humans and machines. A human interacts with a machine in a number of ways, for example, through text, speech and graphics. Researchers at the ICCS are studying these methods and are working on how they can be improved.

www.iccs.inf.ed.ac.uk

ianc | Institute for Adaptive and Neural Computation

Research at the IANC is centered on brain processes and artificial learning systems both theoretically and empirically. The institute encourages interdisciplinary and collaborative work involving the traditional disciplines of neuroscience, cognitive science, mathematics and statistics. Many of the information processing tasks under study in these areas draw on a common set of principles and by studying both artificial and biological systems, the same types of problems can be addressed from two different perspectives.

www.anc.ed.ac.uk

icsa | Institute for Computing Systems Architecture

Research at the ICSA is focused on Computer Science as we know it in its most conventional sense. Academics are primarily concerned with the architecture and engineering of future computing systems. As a result, projects with the institute explore how existing computational systems can be improved and how new engineering systems can be created.

www.icsa.inf.ed.ac.uk

ipab | Institute of Perception, Action and Behaviour

Research in IPAB investigates how to link, in theory and practice, computational perception, representation and generation processes to external worlds. Active areas of research where these issues are pertinent include bio-mimetic robotics, computer-based visual perception, dynamic control of the interaction of robotic systems with their environment or each other, computer-based generation of external phenomena, such as images, music or actions, and agent-based interaction with other agents or humans, as in computer games and animation.

www.ipab.inf.ed.ac.uk

ilsi | Informatics Life-Sciences Institute

The ILSI is a recently formed institute which acts as an interface between the School of Informatics and other natural science subjects within the University. Research builds upon established activities such as neuroinformatics (at IANC), modelling languages (at LFCS), sensori-motor control and bio-mimetic robots (at IPAB), and bioinformatics at the Centre for Systems Biology.

www.ilsa.inf.ed.ac.uk

lfcs | Laboratory for Foundations of Computer Science

The basis of research carried out at the LFC surrounds the understanding of key problems and issues arising in Informatics. Research at the institute explores how these problems can be represented through appropriate and applicable formal models and mathematical theories.

www.lfcs.inf.ed.ac.uk

Other collaborative work:

SICSA – Scottish Informatics and Computer Science Alliance

In addition to the institutes, the School also collaborates with a number of Scottish universities through the research alliance SICSA. The alliance aims to consolidate and develop Scotland's position as an international research leader in informatics and computer science (ICS). Research covers virtually all areas of computer science and informatics from low-level hardware design, through networking and middleware, to wetware, artificial intelligence, human computer interaction and social informatics.

www.sicsa.ac.uk

Informatics has strong links to and interactions with a wide variety of other disciplines. The School contributes to 14 other interdisciplinary research units, both within the University of Edinburgh, and beyond.

www.inf.ed.ac.uk/research

Research areas *continued*

In addition to Taught MSc courses, postgraduate students can also choose to take a research MSc course, a Master of Philosophy (MPhil) or a Doctor of Philosophy (PhD) in a subject area of their choice.

The School's research portfolio is vast. We can accommodate a great number of student research projects in Computer Systems, Artificial Intelligence, Cognitive Science, Machine Learning and Bioinformatics to name but a few of the areas covered.

Applicants should visit www.inf.ed.ac.uk/research to identify a research area that is of interest to them. We also encourage our applicants to propose research topics, so if you have an idea, please approach us.

MSc by Research

This one-year course provides you with the opportunity to acquire research skills by undertaking independent study related to the School's on-going research programme. The emphasis in this course is on independent research work, but you will also attend research training classes.

Master of Philosophy (MPhil)

An in-depth, two-year research course. The objective of this programme is to produce a research worker who has acquired a good all-round knowledge of Informatics, in-depth knowledge of a specialist area, and the research skills to carry out and present a piece of original research for submission for a higher degree.

Doctor of Philosophy (PhD)

For those with a thirst for knowledge. Our PhDs last 36 months if studying full-time. The programme is structured to train you as a researcher with a well-developed all-round knowledge of your discipline, in-depth knowledge of a specialist area, research and communication skills.

All courses can be taken on a part time basis. For more details please see: www.ed.ac.uk/schools-departments/informatics/postgraduate

Doctoral Training Centre in Neuroinformatics and Computational Neuroscience

We offer two interdisciplinary programmes intended to train students with backgrounds in the physical, mathematical and computer sciences to do neuroscience-related research. Projects can include computational modelling, cognitive neuroscience, neuromorphic hardware and software systems, and biological data analysis and visualisation.

The Neuroinformatics MSc/PhD program leads to an Edinburgh PhD degree at the end of four years. The European Study Programme in Neuroinformatics (EuroSPIN) is offered jointly with universities in Sweden, India, and Germany, leading to a PhD degree from one of the partner universities in three years.

For more information please see: www.anc.ed.ac.uk/dtc

Research case studies

Research carried out at the School of Informatics is world leading, innovative and fun. As a postgraduate student you will have the opportunity to explore your own research ideas and contribute to this world leading research.

Research Profiles:

Galileo

Mathematical theories and models are fundamental to any scientific research and how we, the general public, understand the world. Changes or modifications to these theories can therefore have revolutionary implications.

To take a historical example, according to Newtonian physics, galaxies should revolve in a specific way. However when technology became available and their movements were actually tracked and measured they did not move as predicted by Newtonian physics. Therefore the theory of dark matter was postulated, to explain this unexpected movement.

The Galileo project at the School of Informatics aims to create general-purpose repair plans for resolving logical inconsistencies between conflicting theories, in situations such as this. These repair plans help to resolve discrepancies and consequently provide researchers with a more accurate model of the real world.

To find out more see: www.dream.inf.ed.ac.uk

Virtual Worlds for Teaching, Research & Emergency Response

Many people believe that virtual worlds are forerunners of how we will interact on-line in the future. Currently a lot of research is being done into how virtual worlds can be used to aid collaboration and interaction for a variety of uses from emergency response operations centres to supporting workshops, meetings, graduations and social events. Staff and students at the School of Informatics are carrying out a variety of projects in this area and are working within the "Virtual University of Edinburgh" (Vue) with a wide range of departments and units across the University. Research is focused on the creation of an instrumented virtual "space for intelligent interaction" (I-Room) with applications to emergency planning and response.

To find out more see: <http://openvce.net/iroom>

Machine Learning for Robotics

An important area of our research is machine learning for robotics. Here researchers are exploring how robots can learn complex tasks that humans often take for granted using techniques such as motion tracking and speech recognition. By exploring how robots can better sense, plan and move, researchers can apply this knowledge to a number of different uses. For example, by using robots in the rehabilitation and care of patients, to enhance prosthetic limbs and for carrying out tasks in hostile or dangerous environments.

For more information see: www.ipab.inf.ed.ac.uk

Career opportunities

Computers are now ubiquitous in modern life. The most interesting and best-paid opportunities in the future are open to those who really know about computing, software and information systems.

Graduates with degrees in computing still have excellent prospects of employment, in fields that will shape our society. Here are just a few examples:

Media and entertainment industry:

If you have seen the inside of a television, radio or music recording studio you will appreciate the extensive interdependence of media and information technology. Applications of informatics in media and entertainment include advanced CGI for films, creative web access to museum collections, tools for music composition, and new media, such as virtual reality.

Mobile systems: From mobile phones to iPods, there has been an explosion in the amount of information we can carry with us, or access on the move. Advances in computation and information processing are at the root of this technology – from compression algorithms for pictures and sounds, to faster and more reliable communication networks.

User-friendly technology: New technology often brings new problems. Improving the interface, for example, by building computer systems that can understand everyday language, will make technology more accessible to all. Complex systems, such as coordinating emergency services or security monitoring, require advanced information processing that uses intelligent algorithms.

Environment: Understanding the effects of human actions on the environment – local and global – is an enormously complex problem. Accurate prediction requires three-dimensional time-varying simulations that need optimised code running on high-performance parallel computing systems.

Two notable Edinburgh Informatics alumni are:

Bob Kowalski

Now Professor Emeritus and Senior Research Fellow with the Department of Computing, Imperial College London, Bob Kowalski studied for this PhD at the School of Informatics (then the Department of Computer Science) in the 1970s. Professor Kowalski has been dubbed the ‘father of logic programming’.

Andrew Fitzgibbons

Currently working at Microsoft Research, Andrew studied for his PhD in Artificial Intelligence from the School of Informatics in 1997. Andrew has won a number of prizes and has developed an automated camera tracker used in numerous feature films including the Harry Potter and Lord of the Rings trilogies.

Facilities and resources

As a postgraduate student you will be based in our award winning building, the Informatics Forum in central Edinburgh.

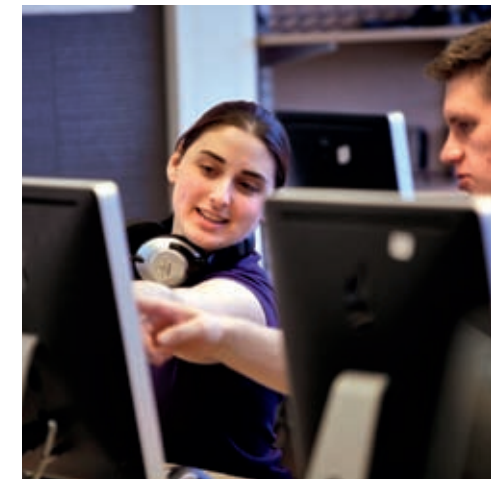
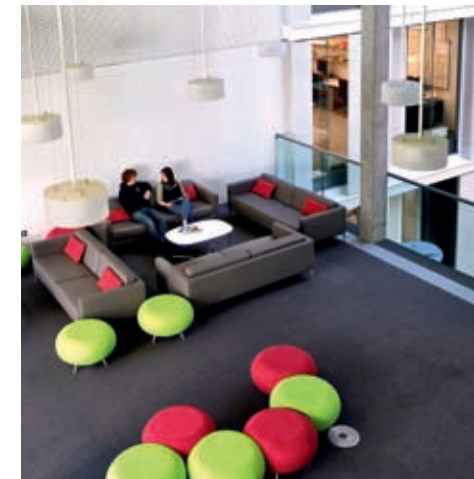
The School has state-of-the-art computing facilities and student laboratories with 24-hour access. In 2008 we moved into a new award winning building; the Informatics Forum, a purpose-built research facility located in the city centre, on the University’s main campus. The Forum sits alongside new teaching, conference and technology transfer facilities in Appleton Tower.

As a postgraduate student at the school you will benefit from:

- 24hr access to the Informatics forum including conference rooms, meeting areas, social breakout areas, kitchens and coffee space
- 24hr access to computer labs
- 24hr access to robotic workshops
- Support from the Informatics Teaching Organisation

Forum awards

- Scottish Design Award, Chairman’s Award for Architecture
- Scottish Design Award, Public Building Award
- Royal Institute of British Architects Regional Award
- Royal Institution of Chartered Surveyors (RICS), Scotland Sustainability Award
- RICS Scotland Project of the Year Award
- Edinburgh Architectural Association Building of the Year, Commended
- British Council for Offices Regional Award for Best Corporate Office Building
- Royal Incorporation of Architects in Scotland, Andrew Doolan Prize ‘Best Building in Scotland’
- Carbon Trust Commendation for Sustainability
- Civic Trust Awards 2010



Entry requirements and fees

Entry Requirements

You will need a good first degree in a relevant discipline.

Ideally applicants should have a first or upper second class honours degree, or equivalent, in an area of Informatics, such as Artificial Intelligence, Cognitive Science or Computer Science. You should also have experience in computer programming.

Applicants with degrees in the following disciplines will also be considered:

- Education
- Electrical Engineering
- Linguistics
- Mathematics
- Philosophy
- Physics
- Psychology

Fees

Tuition fees and additional programme costs are payable for each year of active study, typically one year for MSc, two years for MPhil and three years for PhD.

Visit the on-line University Postgraduate Prospectus for detailed information on fees and finance at: www.ed.ac.uk/schools-departments/student-funding/tuition-fees

Scholarships and bursaries

A variety of funding opportunities are available. Candidates should apply for postgraduate study or research at the University before applying for a scholarship.

The School offers around 70 scholarships for both taught masters and research students:

Scholarships for Taught Masters Students

The school currently offers 20 Scholarships for taught masters students.

For the most current information on these please see: www.ed.ac.uk/schools-departments/informatics/postgraduate/mscscholarship

Scholarships for Research Students

Around 50 research scholarships are available each year to new PhD students.

Many of these are full scholarships, paying tuition fees, research costs, and a stipend to cover living expenses. The rest are partial scholarships, paying tuition fees and research costs and/or a contribution towards living expenses. Because the scholarships cover fees at UK/EU rate, overseas students should also apply for an Overseas Research Student Award to cover the remainder of the fee.

For the most current information on these please see: www.ed.ac.uk/schools-departments/informatics/postgraduate/researchscholarships

Making your application

How to apply

You can apply online via EUCLID, the University of Edinburgh online application system.

Although we make decisions about acceptance throughout the year, we encourage you to apply as early as possible in the academic year prior to that in which you wish to study.

You may make your application at any time, however there are advantages to applying early due to high demand for programmes or if scholarship deadlines apply.

Application deadlines

16 February	Deadline for applications to the MSc/PhD in Neuroinformatics programme
27 February	Deadline for applications which involve an Overseas Research Student Award
Mid-March	All other applications
Mid-September	Academic year starts for MSc students. Research students are also encouraged to start

Contact

We hope you will consider studying at the University of Edinburgh's School of Informatics, with our exciting degree courses, and that the information in this booklet helps you to decide. If you have any queries, don't hesitate to contact us at:

Research Programmes:

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Edinburgh EH8 9AB

T +44 (0) 131 650 3091
F +44 (0) 131 651 5630
E phd-admissions@inf.ed.ac.uk

Taught Programmes:

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Appleton Tower
11 Crichton Street
Edinburgh EH8 9LE

T +44 131 650 9970
F +44 (0) 131 650 2957
E ito@inf.ed.ac.uk

www.inf.ed.ac.uk/postgraduate

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