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Computer Science Undergraduate study 2016

www.nottingham.ac.uk/computerscience



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Front cover image:
Sally Jones studying in the school's atrium.



Students working in the School of Computer Science Hub.

Welcome to the School of Computer Science

Welcome to the School of Computer Science at The University of Nottingham. We are pleased that you are considering studying one of the most diverse and relevant subjects of the 21st century, and delighted that you are thinking of applying to study it here.

As you will discover from reading this brochure, we offer world-class teaching and a stimulating study environment. In the latest Research Excellence Framework, we were ranked 9th in the UK for research power, with 88% of our research activity classified as being world-leading or internationally excellent. This means that your lectures and seminars will be based around the latest developments – something that's absolutely vital in a fast-moving industry like computer science – and that you will be taught by lecturers who are world-leading researchers in the subjects they teach. Staff and students are currently exploring areas including mobile computing, the fundamental principles of logic and discrete mathematics, and the application of those principles to gaming, scheduling and mobile robotics.

You will benefit from up-to-the-minute software, dedicated computer labs and wireless access throughout the school building and in the on-campus halls of residence. Not only that, our connections with employers open up exciting possibilities for your year in industry or summer internship, if you choose to take this option. The school was delighted to have been awarded Best School/Department at the University's 2013/14 and 2014/15 Staff Oscars, a student-led event. This shows that we really do offer great teaching, great support, a great community and a lot more.

At the end of your degree, your employment prospects will be excellent. Our degrees are designed to equip you with an in-depth knowledge of how computers work and how that knowledge can be applied to design and implement the systems of the future. Coupled with an impressive range of valuable transferable skills such as problem solving, project management and independent research, this means that you will be well positioned to apply for positions with companies such as Adobe, Google, IBM and Microsoft.

Choosing where to study is obviously a big decision and we would encourage you to do as much research as you can. Please read this brochure, check our website for more detailed information and take advantage of our open days, where you will be able to see the facilities for yourself and put any questions you might have to our friendly students and staff.

We look forward to meeting you.

Professor Uwe Aickelin
Head of the School of Computer Science

 [UoNComputerScience](#)

 [@UoNComputerSci](#)

Why study computer science at Nottingham?

At its core, computer science is about representing, transforming, analysing and distributing information. Information can come from very different sources and mean different things, this information is known as 'data' and in the modern world, data is everywhere!

Computer programs help us to process and store data, whether that means simply automating office paperwork or creating sophisticated software that allows facial expressions to be tracked in video streams, to artificially intelligent algorithms that can learn to connect contacts on social networks or even programs that allow prices of stocks to be retrieved from the current markets. A computer science degree will teach you how to process a plethora of information, no matter what form it comes in.

Computer science as a discipline is intimately concerned with knowing in detail how computers and computer systems work. Building on that knowledge helps us understand how we can build computer systems and then program them to do what we want them to do. It's also about the way computers store and process information and how humans and computers interact with each other.

Computer scientists need to look at down-to-earth engineering issues such as building tools that help us create large-scale software systems. However, at the other end of the scale, there are challenging philosophical issues about what can, or can't, be computed. This leads us to ask profound questions about the fundamental nature of the 'computation' process.

A computer science degree from The University of Nottingham will leave you well placed to understand how to program today's computers and also how to design and implement the systems of the future, whether they are a traditional computer system, a smartphone, the next internet or something completely new.

About us

The School of Computer Science employs approximately 45 members of staff and typically accepts 130 undergraduate students per year. We are based on Jubilee Campus, a beautifully designed campus with striking buildings, innovative green technology and plenty of open spaces.

Our courses are constantly reviewed to ensure their content is up to date. The most recent course review (2014) has been designed with guidance from the Association for Computing Machinery (ACM), and the Institute of Electrical and Electronic Engineers (IEEE). Many of our students and alumni endorse that one of the most popular and valuable elements is the second-year group project.

The school has now won Best School/Department for the second year in a row (2014 and 2015) at the University Staff Oscars, where students nominate academic staff/support staff or their school.

Research-led teaching

Equally important for you as a student is the quality of the school's research. Computer science is a subject that changes at such a speed that it is vital that you are taught by people who are driving the subject forward. In the 2014 Research Excellence Framework, we were ranked 9th in the UK for research power, with 88% of our research activity classified as being world-leading or internationally excellent, and our research environment receiving the 2nd best rating in computer science in the UK.

Being taught by staff who are carrying out research means your knowledge is up to date and relevant, and that you learn from people who are genuinely excited about what they teach.

You might find yourself working on world-leading research for your third or fourth-year project, or they may inspire you to carry out your own research at postgraduate level.

For more information about the research interests of some of our members of staff, see page 24.

Professional recognition

Our BSc Computer Science and BSc Computer Science with Artificial Intelligence degrees are accredited by the British Computer Society (BCS), which is the licensing body for the Engineering and Science Councils. This is not only an external recognition of the excellence of our curricula and teaching but also a recognition that the knowledge and skills you learn while studying for your degree are academically excellent and of relevance to industry. Graduates from these degrees qualify for exemption from the BCS Professional Examination; hence their degree counts as partial fulfilment of the requirements for full professional accreditation of Chartered IT Professional, Chartered Engineer and Chartered Scientist.

Facilities

We provide all the facilities you will need to succeed in computer science. Along with access to University-wide facilities, computer science students will have exclusive use of the following:

- four refurbished workstation labs with regularly updated hardware within the school, providing a total of 143 PCs running mainly Windows 7 – with 24-hour access
- Ample study space for group work in labs and common areas. Private study areas are also available to students
- Extensive mains power are also available to students using their own devices
- University-wide wireless access

- a pool of Linux workstations and remote access to Linux (SuSE/CentOS) servers
- virtual servers for teaching and projects in a high availability cluster
- MSDN® access for registered students
- External remote full desktop access to the computer science teaching environment from personal mobile and desktop devices

Student societies

The Students' Union is home to over 200 societies and student groups that are available for you to join. CompSoc and HackSoc are the two computer science societies.

CompSoc

CompSoc counts the majority of computer science students among its members, as well as students from other schools who have a keen interest in what they do. It hosts a number of events throughout the year, including the computer science careers fair, talks from prestigious employers and various social events. The society also hosts joint socials with other societies, allowing its members to meet new people.

HackSoc

HackSoc were voted Best Newcomers in the Student Union Awards and has already attracted 150 members. The society hosts programming events for experts to complete beginners, as well as tutorials and talks. Its members also compete in programming competitions globally. HackSoc members already have a string of prizes they have won at programming competitions.

For more information please visit www.uoncompsoc.org.uk and www.hacksocnotts.co.uk

IT Community Consultancy Project

This unique project offers a taste of what you could be doing once you graduate and it also helps you to build on your employability skills. The project provides technology solutions to help improve a local charity's performance. The commitment is half a day a week from January to April and you'll receive support and mentoring plus the opportunity to apply for a small grant to cover expenses.

Recent projects include:

- Responsibility for assessing and suggesting improvements to hardware and information storage systems for Nottingham Elders Forum (a volunteer-led organisation that exists to ensure the voices of older people are heard and their needs and aspirations are acted upon)
- Exploring and recommending new customer relationship management systems for the Indian Community Centre Association in Nottingham (a charity that aims to be the first port of call for Indian people within the city of Nottingham and Nottinghamshire)
- Researching and implementing a customer relationship management system for Double Impact (a charity that aims to provide a quality service which promotes recovery and community integration for people who have experienced problematic drug and alcohol use)

Competitions and events

The school organises and is involved with many local events and competitions. We host an annual programming competition, usually in the first week of term, and then winners train to take part in the Northwest European regionals. The school will also support students attending any national and international competitions if they do well.

Computerphile

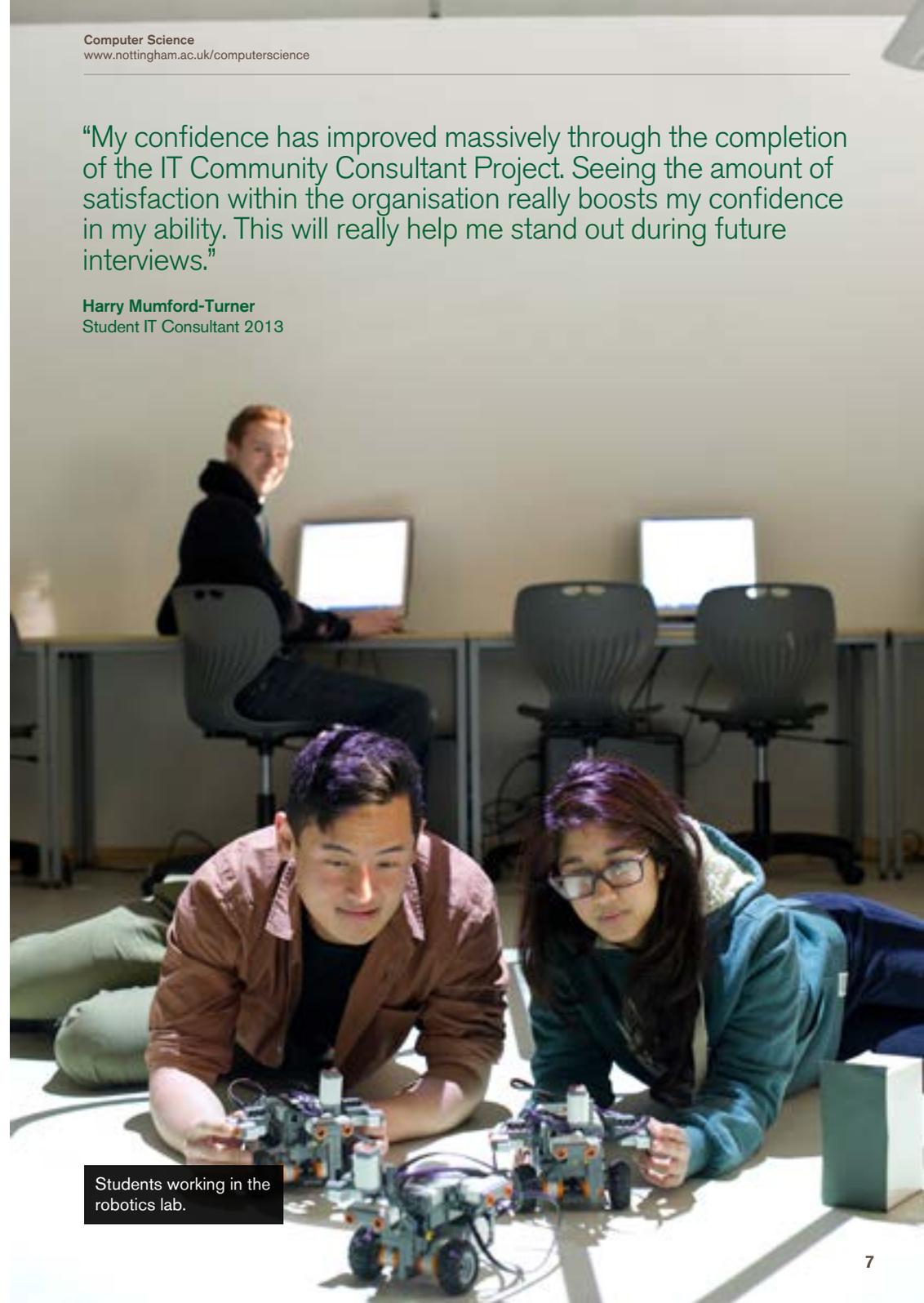
Computerphile is a YouTube channel run by Brady Haran and Sean Riley, who are two former employees of the local TV station (BBC East Midlands).

Computerphile now features just over 200 videos on all aspects of computing and are pitched at computer enthusiasts either in the last year of secondary school or in the first year of university studies. The lecturers used in these videos are all experts in their field, and around 60% of them feature staff from the School of Computer Science here at Nottingham.

Why not take a look and meet some of our professors, lecturers, researchers and existing undergraduates before you even arrive here to start your studies? All of the videos are available online at www.youtube.com/computerphile

"My confidence has improved massively through the completion of the IT Community Consultant Project. Seeing the amount of satisfaction within the organisation really boosts my confidence in my ability. This will really help me stand out during future interviews."

Harry Mumford-Turner
Student IT Consultant 2013



Students working in the robotics lab.

Degree courses

Computer Science	UCAS code	Duration	A levels	IB	Places
Single honours					
BSc Computer Science	G400	3 years	AAA-AAB*	34-32***	115**
MSci Computer Science	G404	4 years	AAA-AAB*	34-32***	
BSc Computer Science with Year in Industry	G407	4 years	AAA-AAB*	34-32***	
MSci Computer Science including International Year	G406	4 years	AAA-AAB*	34-32***	
BSc Computer Science with Artificial Intelligence	G4G7	3 years	AAA-AAB*	34-32***	
MSci Computer Science with Artificial Intelligence	G4G1	4 years	AAA-AAB*	34-32***	
BSc Computer Science with Artificial Intelligence with Year in Industry	G4GB	4 years	AAA-AAB*	34-32***	
MSci Computer Science with Artificial Intelligence including International Year	G4GA	4 years	AAA-AAB*	34-32***	
BSc Data Science	I260	3 years	AAA**	34****	15

* Three A levels or equivalent, plus 5 GCSE's at grade B including Maths English and a Science.

AAB if A levels include computing/computer science. Please see page 30 for excluded subjects.

** Including A in maths or A*AB (with A* in maths) or AAB (with A in maths) if this also includes an A level in computer science.

*** Including 5 in Standard or Higher Level mathematics.

**** Including 6 in maths at Higher Level.

** Approximately 115 places for all single honours courses.

In all our courses, year one is a qualifying year. The first year of study will help you settle into University studies, help you to get used to the necessary pace of working, and is crucial as a foundation for succeeding years. You will need to be successful in each year in order to progress onto the following stage of your degree.

Course structure

Our course structures are designed to be compliant with the Association for Computing Machinery (ACM) and the Institute of Electrical and Electronic Engineers (IEEE). We are one of the first higher education institutions in the country to be in line with these internationally recognised educational recommendations.

Alongside our core computer science BSc and MSci degrees, we also offer the specialist single honours degree computer science with artificial intelligence. This degree combines the core elements of computer science with a specific focus on artificial intelligence; the degree is available as both a three-year BSc and a four-year MSci.

We also offer BSc Data Science joint with the School of Mathematical Sciences. You will study an equal split of modules from both schools for the duration of the course.

BSc or MSci?

While our BSc courses provide a broad grounding in computer science, the fourth year provides you with further opportunities to study specific topics in greater detail. The fourth year also involves participation in an advanced project that engages with current research in computer science or with parties from other schools and industry.

We treat applicants to both BSc and MSci programmes in the same way during the admissions process and recognise that you may not be sure which will suit you best. We are flexible throughout your first two years of study and you can transfer between them, subject to satisfactory performance.

Students without programming experience

What we are looking for when you apply for computer science is an enthusiasm for the subject and evidence of why you would do well. Importantly, programming experience is not compulsory for entry to any of our courses.

A level preparation

Our courses are designed so that they can be taken by a good student with a minimum of grade B at GCSE mathematics.

We do not assume that you have taken A level computing/computer science. If you have not taken this A level, you may find you need to work a little harder in your first year than your peers who have, as more of the topics you encounter may be new to you. You can be assured, however, that you will not be disadvantaged in the long term. Students without A level computing/computer science are on an equal footing by the end of the first year and do just as well in subsequent years.

If you have taken computer science/computing at A level then you will still find plenty to challenge you. The first-year syllabus contains material that is new to all students and even topics which you have encountered before will be taught in new ways and in greater depth.

Teaching themes

The computer science modules are organised under a set of 'themes'. We have organised themes based on major sections of the ACM computer science curriculum. Themes are not absolutely separate and some modules overlap more than one theme, however this way of organising modules enables students to choose their modules in a coherent manner.

Getting the foundations right

A key element in all of our courses is the year-one computer science core. This is an integrated set of modules designed to provide you with a solid foundation for study in later years, that is compliant with the Association for Computing Machinery (ACM) and the Institute of Electrical and Electronic Engineers (IEEE), and will help you with the transition to university-style learning. You will find the core introduces you to new topics that will be important later on in your studies with us. Our first year is common to all single honours courses (with the exception of data science), meaning you will also be able to transfer between courses at any point up to the start of your second year.

What's in the computer science core teaching syllabus?

Our syllabus is organised around seven main thematic areas in computer science:

- **Artificial Intelligence, Modelling and Optimisation** – Introduction to Artificial Intelligence
- **Foundations of Computer Science** – Algorithmic Problem Solving, Mathematics for Computer Scientists, Algorithms and Data Structures, Introduction to Formal Reasoning, Machines and their Languages

- **Human-Computer Interaction** – Introduction to Requirements Engineering
- **Operating Systems and Networks** – Computer Communications and Networks, Computer Systems Architecture, Unix and Software Tools, Concepts of Concurrency, Operating Systems
- **Programming** – Introduction to Programming, Introduction to Object-Oriented Programming, Introduction to Functional Programming, Application Programming, Compilers
- **Software Engineering** – Introduction to Software Engineering, Database Systems, Software Engineering Group Project, Computers in the World
- **Projects** – Software Engineering Group Project, Individual Dissertation Single Honours

The core computer science syllabus includes selected topics from these themes. As an example, first, second and third year single honours computer science compulsory modules are mapped above. Depending on your selected degree programme, you will also take a selection of modules from various themes, and will have a wide choice of optional modules.

Students working on a project in the Computer Science Hub.



Single honours

BSc/MSci Computer Science

The computer science degree forms the core of our teaching programme. You will develop a sound knowledge of the fundamentals of computer science, including appreciations of the interaction between hardware and software; an understanding of human-computer interaction and the sociological impact of information technology; knowledge of the professional standards and ethics of the computer industry, together with the skills and confidence to react to its ever-increasing rate of change.

This course is designed to produce high-quality graduates who show independent thought, flexibility and maturity and who command a sound technical knowledge of the broad aspects of computer science. You will gain an appreciation of current computing practice so that the skills learned can be applied immediately after graduation. The course also provides an understanding of the nature of computer science as an academic discipline.

BSc/MSci Computer Science with Artificial Intelligence

Computer Science with Artificial Intelligence is designed to offer both a broad understanding of computer science as well as specialist skills in artificial intelligence. Additionally, optional module choices offer the opportunity to study computer science in the context of robotic systems.

In addition to fundamental computer science classes and laboratories, the course covers topics including expert systems, intelligent agents, the history and philosophy of artificial intelligence, machine learning, computer vision, neural networks, heuristic optimisation and other intelligent systems. By following this programme you will learn how to develop new methodologies and novel computational techniques for the creation of systems with human-like intelligence. The degree is supported by world-leading research undertaken within the school.

BSc with a Year in Industry

BSc Computer Science and BSc Computer Science with Artificial Intelligence are available as four-year programmes that include an integrated year in industry.

We provide second year students with all the support they need to find a placement that suits them, including careers events specifically for students looking for placements. Our careers team will provide drop-in expertise and timetabled tutelage that will help develop careers skills such as CV reviews and mock interviews.

In their third year, students will head out into industry, building invaluable skills and complete an assessed reflective log of their experiences. They will receive any support they need from an academic tutor who will also maintain contact and visit students out on placement.

MSci with International Study Year

MSci Computer Science and MSci Computer Science with Artificial Intelligence are available as four-year programmes that include an international study year.

Many students take a year away from Nottingham and study at an approved university abroad. The difference with this course is that the year abroad forms an integrated element of their course and is reflected as such on their certificate and transcript. As well as enabling you to experience a different culture, studying abroad is an excellent opportunity to see how computing themes are approached in other countries.

Our close links with universities across the globe mean that we are able to offer a variety of study abroad placements in Australia, Canada, China, Mexico, New Zealand, Spain and more!

Typical modules for G400/G404/G406/G407/G4G7/G4G1/G4GB/G4GA

Year one	Year two	Year three	Year four (MSci only)
<p>Core modules (120 credits):</p> <ul style="list-style-type: none"> ▪ Programming and Algorithms ▪ Computer Fundamentals ▪ Systems and Architecture ▪ Mathematics for Computer Scientists ▪ Databases and Interfaces ▪ Introduction to Software Engineering ▪ Programming Paradigms ▪ Fundamentals of Artificial Intelligence 	<p>Core modules:</p> <ul style="list-style-type: none"> ▪ Software Group Project ▪ Algorithm Correctness and Efficiency ▪ Topics in CS ▪ Operating Systems and concurrency ▪ Languages and Representations ▪ Human Computer Interaction ▪ Software Quality ▪ Artificial Intelligence Methods <p>Optional modules include:</p> <ul style="list-style-type: none"> ▪ Introduction to Image Processing ▪ Advanced Functional Programming ▪ C++ Programming ▪ Graphical User Interfaces ▪ Planning Search and Artificial Intelligence Programming 	<p>Core modules:</p> <ul style="list-style-type: none"> ▪ Third-Year Project ▪ Professional Ethics ▪ Computer Security ▪ Software Specification <p>Optional modules include:</p> <ul style="list-style-type: none"> ▪ Automated Decision Support Methodologies ▪ Autonomous Robotic Systems ▪ Collaboration and Communication Technologies ▪ Computability ▪ Computer Graphics ▪ Computer Security ▪ Fuzzy Sets and Fuzzy Logic Systems ▪ Knowledge Representation and Reasoning ▪ Machine Learning ▪ New Media Design ▪ Software Quality Management 	<p>Core modules (40 credits): Either Individual or Group Project</p> <p>Optional modules include:</p> <ul style="list-style-type: none"> ▪ Advanced Computer Communications ▪ Advanced Algorithms and Data Structure ▪ Computer Vision ▪ Connected Computing at Scale ▪ Design Ethnography ▪ Designing Intelligent Agents ▪ Mathematical Foundations of Programming ▪ Methods for Understanding Users in Computer Science ▪ Mobile Device Programming ▪ Operations Research and Modelling ▪ Simulation for Decision Support ▪ Ubiquitous Computing ▪ Selected topics in Artificial Intelligence

For more detailed module information please visit the individual course listings at www.nottingham.ac.uk/ugstudy

BSc Data Science

From natural science, through the business, finance and retail sectors to social networking and mobile devices, computer-based systems now generate huge volumes of data almost continuously.

Large data sets have become the norm in a wide variety of disciplines and applications. While it represents a phenomenal resource, the rapid emergence of big data brings challenges: there is now an urgent need for graduates skilled in the sophisticated mathematical and computational techniques required for large-scale data analysis.

In response to this need, the new discipline of data science is emerging at the interface between computer science and statistics. A recent study estimates that the US alone will face a shortage of up to 190,000 data scientists by 2018.

The BSc Data Science, one of the first undergraduate courses in this area in the UK, produces graduates with the core mathematical and computer science knowledge and skills needed to present, analyse and ultimately understand large data sets. The course is run jointly by the School of Computer Science and the School of Mathematical Sciences, and draws on staff expertise available in each of the schools.

Course content is equally split between mathematics and computer science modules, with an emphasis on statistical and computational data analysis methods, many of which the result of work in artificial intelligence. These are supported by a strong software development theme, providing the skills needed to both understand and apply key techniques. The final-year project provides an opportunity to bring these skills together to address real data analysis problems in a rich and supportive environment.

Typical modules for I260

Year one	Year two	Year three
<p>Core data science modules:</p> <ul style="list-style-type: none"> ▪ Computer Fundamentals ▪ Databases and Interfaces ▪ Fundamentals of Artificial Intelligence ▪ Programming and Algorithms ▪ Calculus and Linear Algebra ▪ Probability ▪ Statistics ▪ Analytical and Computational Foundations 	<p>Core data science modules</p> <ul style="list-style-type: none"> ▪ Algorithms, Correctness and Efficiency ▪ Artificial Intelligence Methods ▪ Introduction to Numerical Methods ▪ Probability Models and Methods ▪ Stochastic Models and Methods <p>Optional modules</p> <ul style="list-style-type: none"> ▪ Human Computer Interaction ▪ Languages and Representations ▪ Software Quality ▪ Topics in Computer Science 	<p>Core data science modules</p> <ul style="list-style-type: none"> ▪ Individual Dissertation ▪ Optimisation <p>Optional modules</p> <ul style="list-style-type: none"> ▪ Decision Support Methodologies ▪ Knowledge Representation and Reasoning ▪ Machine Learning ▪ Game Theory ▪ Coding and Cryptography ▪ Mathematical Finance

For more detailed module information please visit the individual course listings at www.nottingham.ac.uk/ugstudy

The Computer Science Building is perfect to study alone, or in groups.



How will I study?

Teaching and learning

You will learn through a wide variety of activities including formal lectures, small-group tutorials, problem classes and, increasingly important at university, self-directed study.

Lecture-based modules

These modules will form the backbone of your studies in the first year, when you will be taking up to six modules at any given time. Each module will typically involve around three hours of study per week, combining a mix of formal lectures and associated supporting activities such as tutorials, problem classes or computer labs, adding up to a total of about 20 hours of timetabled activity. In later years, you may take fewer, more specialist modules in conjunction with activities such as project work.

Some of our lectures are recorded and the resulting audio-visual materials placed on iTunesU, YouTube and The University of Nottingham U-Now facility, allowing you to go back and revisit topics in your own time.

See www.nottingham.ac.uk/podcasts and unow.nottingham.ac.uk

Practical-based learning

Practical, self-directed study will play a central role in your learning throughout your degree, particularly in relation to the group and individual projects which take place from second year. The Computer Science Building is ideal for this purpose, offering areas such as the hub, atrium and meeting pods in which students can meet and discuss their work. Practical programming learning takes place in one of our recently refurbished labs.

All module-related material and other resources are provided for students in the University's central elearning environment and you will be provided with your own tailored view of this according to your module choices. This will make it easy for you to find information and learning resources throughout your course.

Study support

Advice and support will be available to you from the day you arrive at University. In week one, you will benefit from our course-specific teaching and learning support sessions. You will be introduced to your personal tutor, who can offer guidance on academic and personal matters at any time during the year, should you need it. We also run a Guru Scheme where first years can get advice and support from students who excelled in their first year. Throughout the year, you will be able to seek academic advice from the course director for your degree, tutors and gurus, and module convenors.

A further source of support is the Undergraduate Learning Community Forum, which deals with all issues affecting campus life (social, residential and catering) as well as academic matters.

We hope you will feel at home at Nottingham. However, should you have any problems, the University has specialist support services, including academic and disability support, financial support, a counselling service and faith advice. Please see page 26 for more information.

Library and computing services

At Nottingham, you will benefit from access to an extensive collection of printed and online library resources.

In addition, you will have both on and off-campus access to a very wide range of databases, ejournals and ebooks, relevant both to your subject and any modules in other subjects.

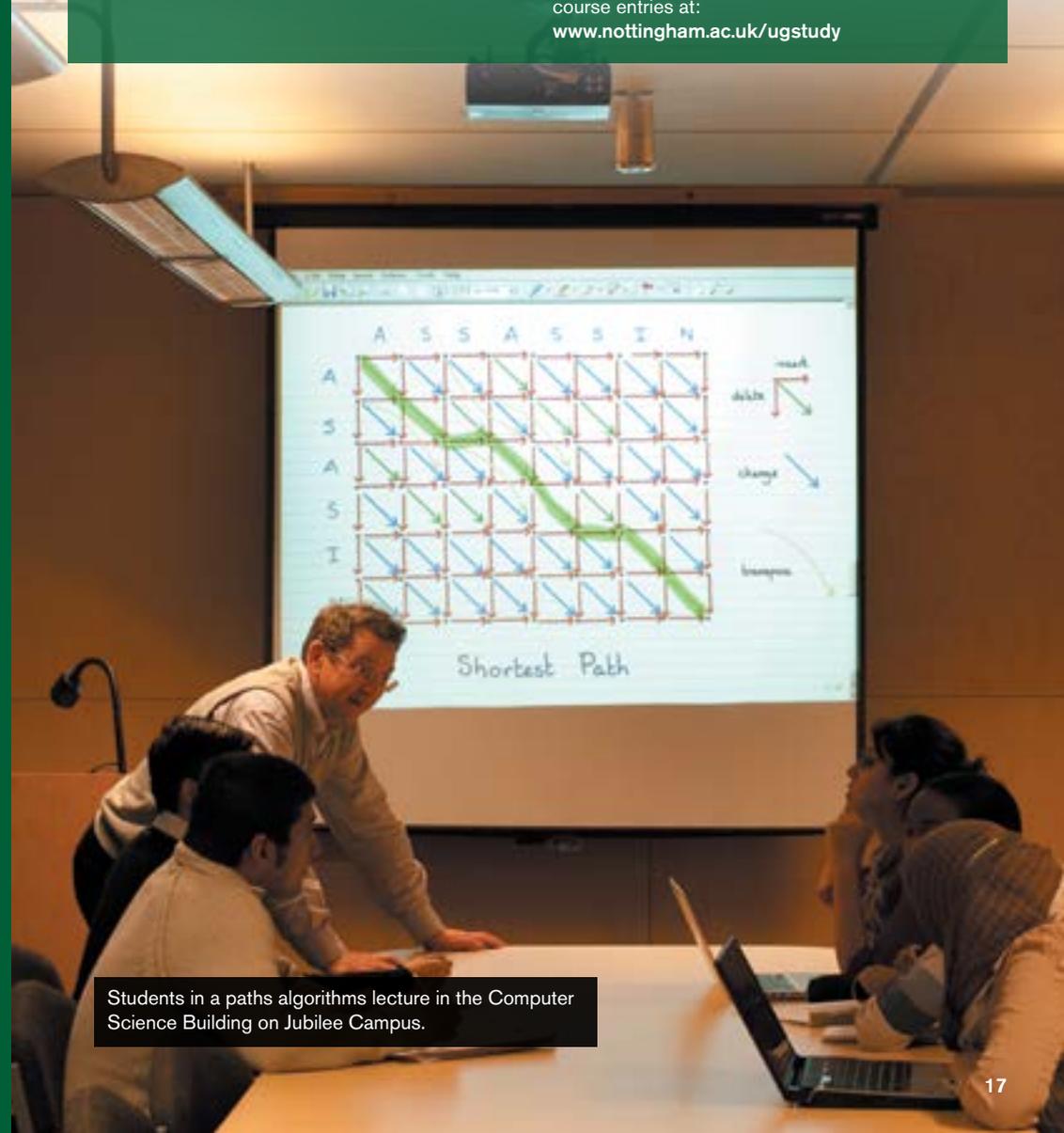
Key Information Sets

Key Information Sets (KIS) are comparable sets of information about full or part-time undergraduate courses and are designed to meet the information needs of prospective students. All KIS data are published on the Unistats website:

www.unistats.com

For Nottingham's KIS data, please see individual course entries at:

www.nottingham.ac.uk/ugstudy



Students in a paths algorithms lecture in the Computer Science Building on Jubilee Campus.

How will I be assessed?

All undergraduate degree programmes in the University are modular, which means you undertake modules of study with assessment at the end of each semester.

Assessment methods

Lecture-based modules will typically be assessed at the end of the semester in which they are taught. A substantial number of computer science modules have an element of practical coursework components as full or part assessment.

Modules and credits

Modules are self-contained units of study which may run either for a semester or a year. The majority of modules are worth 10 or 20 credits each and you will study modules totalling 120 credits in each year. This system gives you some flexibility in the way you construct your course.

Some modules are compulsory; others are optional. Some modules are prerequisites for others. Your personal tutor will be available throughout your time at Nottingham to advise and guide you through the academic pathways available.

The teaching year

The teaching year is divided into two semesters. The first semester lasts for 14 weeks, with 12 weeks for teaching and revision and two weeks for assessment. The second semester follows the same pattern, but there is an additional two weeks at the end to complete the assessment process and to enable returning students to discuss their results with tutors and begin to plan the next session's work.

Although the teaching year is divided into two semesters for organisational purposes, this is fitted into the traditional pattern of three terms: one before Christmas; one between Christmas and Easter; and one after Easter.

Your final degree classification

The emphasis in the first year is on helping you to adjust to university study and on giving you a strong computer science grounding for the more specialised material you will encounter later in your degree.

The marks you get in your first year do not count towards your final degree classification: you simply need to do well enough to demonstrate that you are sufficiently prepared for further study.

On our BSc courses the degree classification is split as follows:
Year two: 40%
Year three: 60%

For Data Science, the split is:
Year two: 40%
Year three: 60%

For students on our MSci courses, the split is:
Year two: 20%
Year three: 40%
Year four: 40%

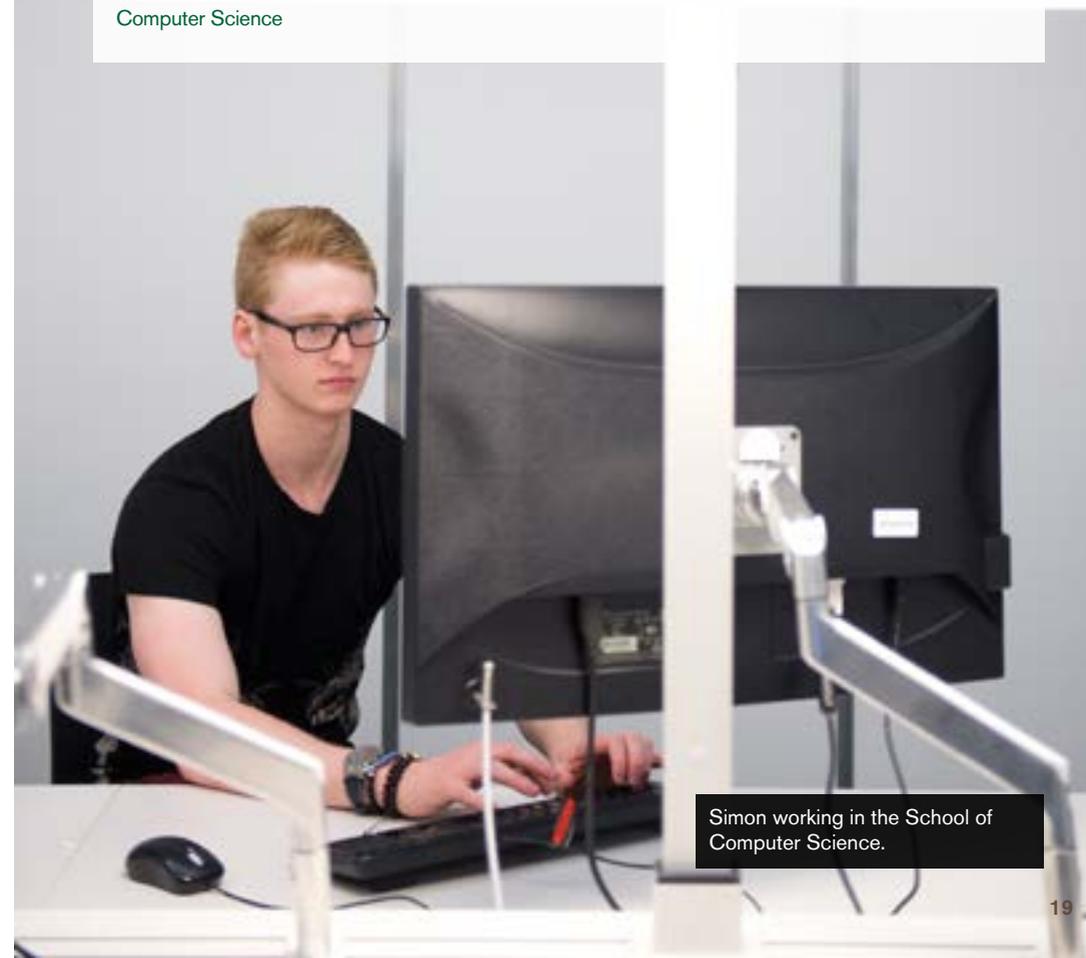
Experience Credits

Experience credits are a new innovative way for our students to earn credits towards their degree. This optional module has been designed so we can offer students recognition of independent development.

Credits can be gained from; code written during an internship, contribution to an open source project, releasing an app, or involvement in teaching and outreach projects.

“Were I to point to one factor contributing most to my education at the university, then I would say it was the outstanding passion that lecturers at Nottingham show for their subject. This passion is inevitably infectious and not only makes the learning process more enjoyable, but makes you want to learn more.”

Simon Furber
Computer Science



Simon working in the School of Computer Science.

Industry placements and study abroad

As well as having courses that incorporate a year in industry or an international year, we offer support to all of our computer science students who want to undertake an industry placement or spend time studying abroad.

Students who take advantage of these opportunities find there are a number of benefits to doing this, including:

- having the opportunity to make contacts and possibly secure a job after graduation
- gaining valuable experience in a workplace – something which is highly attractive to employers
- developing a wider perspective and a better understanding of how the knowledge learned relates to real life
- having increased independence and a more mature outlook

Industry placements

Some recent examples of where students went and the areas they worked in include:

- Accenture – software engineering intern
- BT – software engineering
- Hewlett Packard – application support
- HSBC – systems analysis, development and testing
- IBM – marketing and technical operations
- Merrill Lynch – treasury IT project development
- Microsoft – software engineering
- Next Jump – software engineering intern
- Rolls-Royce – Java programming intern
- S C Johnson – business process technology intern

Here is one student's account of his year in industry:

"There is such an incredible difference between programming for the odd piece of coursework, and programming huge projects over the course of several weeks. My knowledge and ability to program have been accelerated to a level I never thought possible.

Over my year at NextJump, I've worked on so many awesome projects, and I've really honed my skills as a software engineer. I've become a lot more proficient in technologies I already knew (such as PHP, JavaScript, and SQL), but have also had opportunities to learn and practise new technologies, such as the Go language, and the latest frameworks for PHP and JavaScript. I've also learned loads of great techniques for increasing productivity, and time management, which will be invaluable both when I'm back at University, and for when I enter the world of work full time.

Now that my year in industry is coming to an end, I'm really looking forward to my final year of University, which will allow me to apply all the learnings I've gathered from my year in industry, and to have a longer lie-in in the mornings! It's really reassuring going back to University knowing exactly what I want to do afterwards, and I'm now overflowing with ideas for final year projects I can do – all thanks to my year in industry."

Craig Knott
MSci In Computer Science
Software Engineering Intern

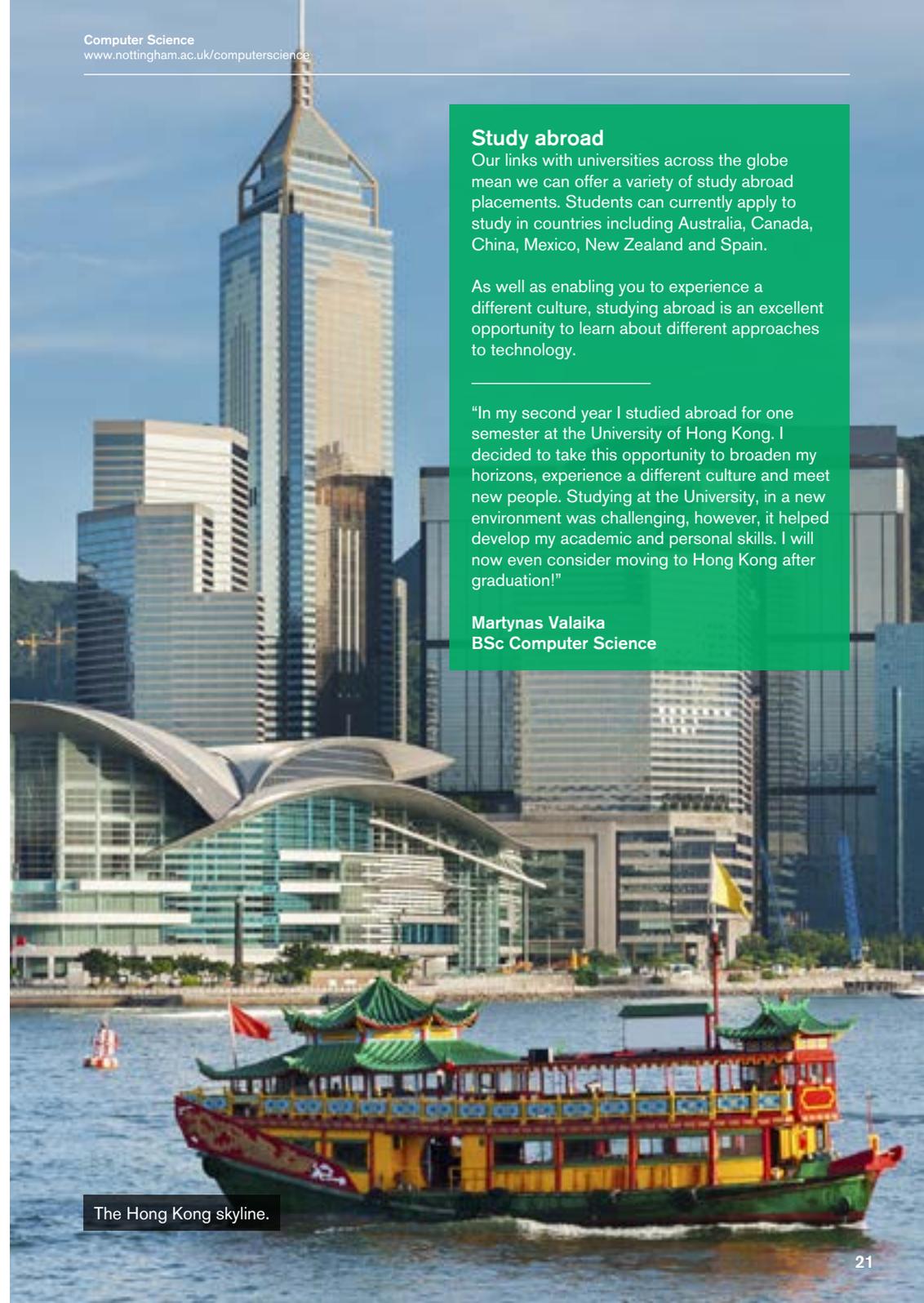
Study abroad

Our links with universities across the globe mean we can offer a variety of study abroad placements. Students can currently apply to study in countries including Australia, Canada, China, Mexico, New Zealand and Spain.

As well as enabling you to experience a different culture, studying abroad is an excellent opportunity to learn about different approaches to technology.

"In my second year I studied abroad for one semester at the University of Hong Kong. I decided to take this opportunity to broaden my horizons, experience a different culture and meet new people. Studying at the University, in a new environment was challenging, however, it helped develop my academic and personal skills. I will now even consider moving to Hong Kong after graduation!"

Martynas Valaika
BSc Computer Science



The Hong Kong skyline.

Career and employment prospects

The University of Nottingham is consistently named as one of the most targeted universities by Britain's leading graduate employers*.

As a computer science graduate, you will have an extensive variety of careers paths open to you. As well as software and hardware development, other options for the expertise and skills gained through your study in computer science include the financial sector, business sector, starting your own company, teaching, and industrial and academic research. We have staff members with experience of all these options who can advise you further.

Graduate career destinations

Recent destinations of graduates from our school include:

- Adobe Systems
- Accenture
- Atos
- BSKyB
- BT
- Barclays
- Barclays Capital
- Capgemini
- Capita
- Citibank
- CyberMAK Information Systems
- Deloitte
- Facebook
- Framestore
- Google
- IBM
- J P Morgan
- Mail Online
- Marketform
- Microsoft
- NHS
- Orange/EE/France Telecom
- Orbis Investment Advisory
- PwC
- Rolls-Royce
- UBS
- Xperia

Average starting salary

In 2014, 96% of first-degree graduates in the school/department who were available for employment had secured work or further study within six months of graduation. The average starting salary was £25,852 with the highest being £45,000.**

Recent graduates

Recent graduates include Olivia Graham – Software Engineer, NextJump Ltd; Miraj Makin – Equities Technology Analyst, J.P. Morgan; Martin Porcheron – PhD in Digital Economy.

Further study

The School of Computer Science runs postgraduate taught masters degrees in Computer Science and Human-Computer Interaction. We also welcome graduates onto postgraduate research programmes where they can benefit from working in an exciting and well-equipped research environment. While more of our graduates choose to study related subjects such as machine learning, e-commerce, information security and psychology.

Careers and Employability Service

Our Careers and Employability Service, which is based on University Park Campus, offers an extensive range of careers-oriented services, including CV-writing sessions, interview advice, presentations by major employers and general career advice. As a University of Nottingham graduate, you will receive lifelong support from the service. This means that you can ask a careers adviser to look over your job application by email or Skype, or in person, and you can also access a database of graduate vacancies. For more information see www.nottingham.ac.uk/careers In addition, each year, industry partners and established alumni from a diverse range of companies work with the school to host external guest lectures and attend careers events.

The Nottingham Advantage Award

The University's Advantage Award is a programme of activities developed to recognise and reward extracurricular responsibilities. It allows you to gain recognition for participating in a wide range of activities accredited by the University and delivered by top graduate employers, professional services and members of staff of the University. It also shows employers that you have gone above and beyond your degree and gained valuable transferable skills. For further information, please visit www.nottingham.ac.uk/careers/advantage

* *The Graduate Market in 2013, 2014 and 2015*, High Fliers Research.

** Known destinations of full-time home and EU first-degree graduates, 2013/14.



A student testing his iPhone-based final-year project on Jubilee Campus.

Staff research interests

Professor Graham Hutton

Professor Hutton co-leads the Functional Programming Lab. His research focuses on next generation programming languages such as Haskell, which provide simple but powerful new approaches to programming. He is also keen on promoting the use of Haskell in teaching, and has published a textbook on programming in Haskell based upon his first-year computer science course in Nottingham. This book has become an international best seller, has been used on more than 90 university courses worldwide, and was translated into a 13-part video lecture series by Microsoft for which the total number of lecture views now approaches one million.

Dr Michel Valstar

Dr Valstar is an Associate Professor in automatic human behaviour understanding. His goal is to create robots and other machines that understand us and interact with us equally as well as other humans do. Using the same techniques taught in the Computer Vision and Machine Learning modules, he creates a range of systems that can recognise facial expressions from video, infer your emotion from audio-visual signals, or that can tell whether your smile is genuine or just polite. He directly uses his research experience in the teaching of the Machine Learning module to make the relevance of the module apparent to the students.

His work was implemented in the SEMAINE system, which lets a user chat with a Sensitive Artificial Listener. These artificial intelligent beings react to you in a natural way even if they don't understand what you are saying, only how you are behaving.

Dr Max L Wilson

Dr Wilson is an Assistant Professor in human-computer interaction and information seeking in the Mixed Reality Lab. His research focuses on user interface design and social media, taking a multidisciplinary perspective from both human-computer interaction (the presentation and interaction) and information science (the information and seeking behaviours). He teaches elements of his research, and other cutting-edge work from his field, in a module called Collaborative Communication Technologies, which includes everything from global use of social media to in-room technological support for collaborative tasks.

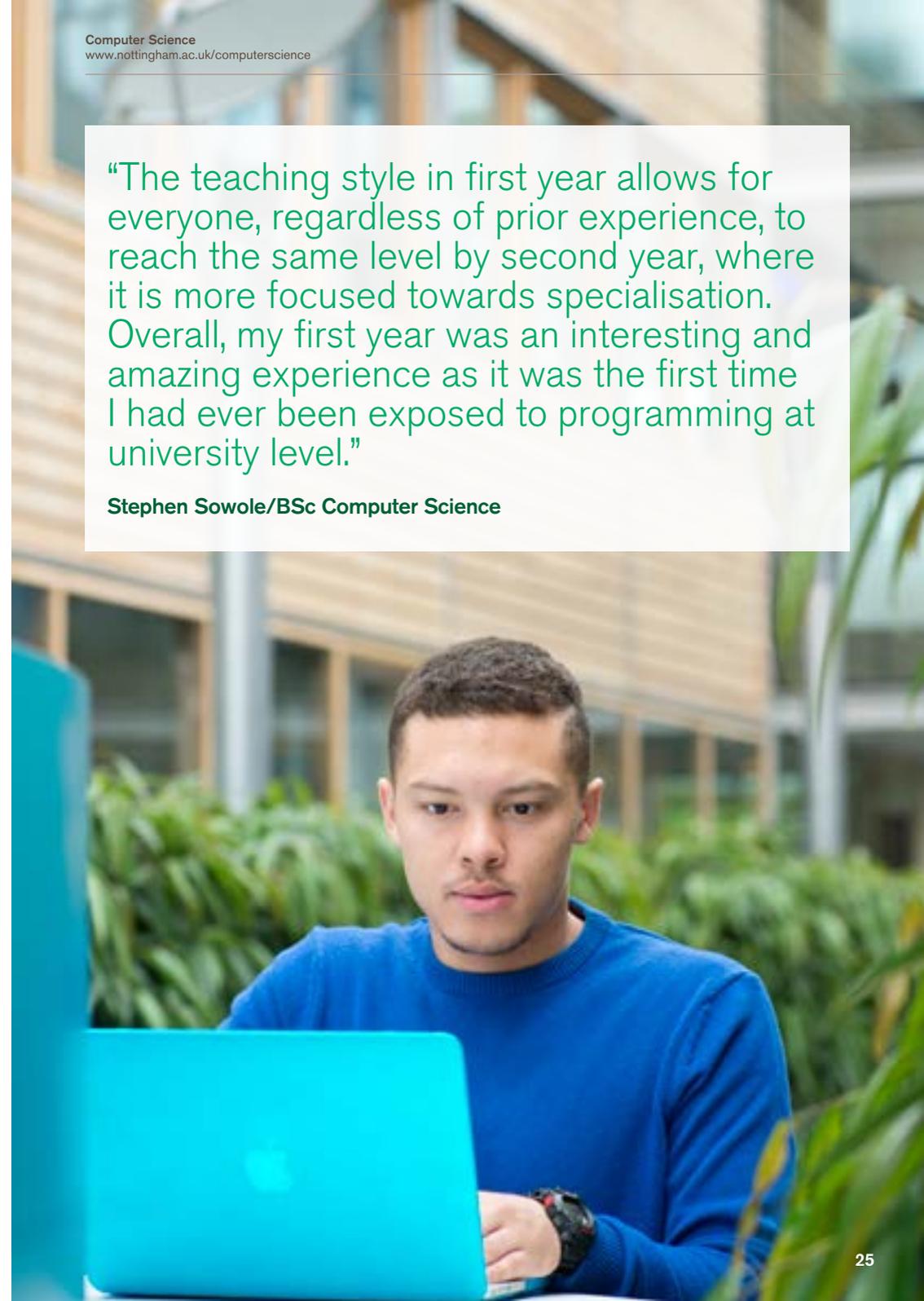
Dr Boriana Koleva

Dr Koleva's main research area is the field of human computer interaction with a particular emphasis on mixed reality interfaces. She has been developing the technique of mixed reality boundaries – a new way of joining together physical and virtual spaces, and more specifically extending the usability of this technology by developing a framework of properties that can be associated with boundaries. Dr Koleva has worked with artists to explore how mixed reality technology can be used to support new forms of interactive art, for example with the Blast Theory performance group on the BAFTA-nominated event installation Desert Rain and with Ken Feingold on the installation Sance Box No 1.

Dr Koleva is currently involved in developing new mixed reality technologies for public settings (such as museums and schools) and for domestic environments. She is also interested in developing conceptual frameworks and software toolkits to help us better understand and construct mixed reality environments.

“The teaching style in first year allows for everyone, regardless of prior experience, to reach the same level by second year, where it is more focused towards specialisation. Overall, my first year was an interesting and amazing experience as it was the first time I had ever been exposed to programming at university level.”

Stephen Sowole/BSc Computer Science



Your student experience

Take a look at our accommodation video for a taster of what to expect at Nottingham:

www.nottingham.ac.uk/go/yourhome



Jubilee Campus is an environmentally-friendly campus with lakes, sustainable buildings and lots of open green space.

You've read lots about the degree programme you're interested in, now it's time to explore life outside the lecture theatre. There's so much for you to get involved in and explore at the University and around the city. We are proud to be one of the leading universities for student experience in the UK*, which will ensure that you have a university experience you'll never forget.

Your University of Nottingham – at home and around the world

We are proud of our stunning campuses and are continually investing in our grounds, buildings and amenities to ensure that you only have the best surroundings in which to live and study.

Our main UK campuses have a mix of state-of-the-art facilities, including sports centres, places to eat and excellent learning facilities on every campus. We've made getting from campus to campus as easy as possible and students can benefit from our free inter-campus Hopper Bus, so you're never far away from the striking architecture and innovative technology of Jubilee Campus, the rolling parkland and period buildings at University Park, or the cutting-edge features of Sutton Bonington.

The University of Nottingham is Britain's global university with campuses in the UK, China and Malaysia. We also have links with more than 300 universities in over 40 countries, adding a truly global flavour to your degree and giving you the chance to explore the world. Find out more: www.nottingham.ac.uk/about/campuses

Your new home from home

At Nottingham we offer a range of different accommodation options, rooms are available as single or shared, en suite or shared bathroom, all the way through to studio flats, and vary from self-catered to fully catered (19 meals per week). We also offer a guarantee of University accommodation for one year to all new full-time undergraduate students, subject to the following conditions: you firmly accept your course place at Nottingham, accept your offer of accommodation by the deadline given in your offer letter, and have an unconditional status no later than 31 August in the year you intend to begin your studies.

If you are a new, full-time undergraduate student who is classified as international for fee purposes, this guarantee applies for three years**. For more information, including a breakdown of pricing, see www.nottingham.ac.uk/accommodation

Your support network

Throughout your university journey there will be numerous people on hand to support you, including tutors and dedicated staff who will be able to advise you on various aspects of life as a student. We have Student Services Centres on all three of our UK campuses, which provide a range of support, information and specialist services to enhance your student experience. This support includes:

- Academic Support – can provide practical advice on areas of academic study; the service also provides specialist academic support for students with dyslexia, dyspraxia and other specific learning difficulties
- Disability Support – coordinates support and access arrangements for students with a disability or long-term medical condition
- Financial Support – provides information on the sources of finance available from government agencies and the University itself, and gives advice about financial matters
- Student Services – also advise on issues ranging from childcare, counselling and health to international student support, chaplaincy and faith support, as well as offering advice on paying your tuition and accommodation fees

Whatever you may need support with, they will either be able to help or point you in the direction of someone who can. Find out more:

www.nottingham.ac.uk/student-services

* *Times Higher Education Student Experience Survey, 2015.*

** Providing you submit your returners' application in line with the requirements of the accommodation providers.

Getting involved in your Students' Union

As soon as you start at The University of Nottingham, you are automatically enrolled as a member of our Students' Union, which is considered to be one of the best in the country. There are hundreds of activities that you could be part of, providing you with the perfect opportunity to take up a new hobby or pursue existing interests. Choose from over 200 student-run societies, covering all interests and abilities, as well as local and national volunteering projects, to which you can commit as much or as little time as you wish.

Our Students' Union is home to a number of award-winning student-run media groups, which give you the chance to gain practical work experience both behind the scenes or centre stage as a presenter, actor or journalist. The Nottingham New Theatre, *Impact* magazine, Nottingham Student Television (NSTV) and University Radio Nottingham (URN) have all been recognised as the best in their field, winning a clutch of awards for outstanding achievements.

However you decide to become involved in the Union, you can be sure you will make new friends and learn new skills, all while having a lot of fun! Find out more: www.su.nottingham.ac.uk

Sports

We offer sport at all levels and an excellent all-inclusive student membership offer, so whether you enjoy sport as a hobby or are an elite athlete we will have just what you need. We have over 70 sports clubs, which means we have the 2nd highest number of sports clubs of any UK university. If you're not interested in joining a team but want to stay fit, we have sports centres on all of our main UK campuses. Find out more: www.nottingham.ac.uk/sport

Exploring your new city

With Nottingham city centre just a 10-minute bus ride away from University Park Campus, our students are always close to the action. Buses run through campus regularly and many run late-night services too, which is handy if you're a night owl.

For music lovers, you can take your pick from the world-famous Rock City, Capital FM Arena or one of the smaller gig venues for a more intimate live show. Nottingham is rich in performance venues, with comedy clubs and theatres catering for lovers of drama, musicals, ballet and panto. We are very proud of our sporting heritage, and with football clubs Nottingham Forest and Notts County in the city, as well as Trent Bridge cricket ground and the National Ice Centre on your doorstep, you might just become a sports fan if you're not one already.

History and culture can be found in all corners of the city, with Nottingham Castle, Nottingham Contemporary arts centre, the Galleries of Justice Museum, Nottingham Lakeside Arts – the University's public arts centre located on our University Park Campus, arthouse cinemas and three of the world's oldest pubs all providing points of interest. If you enjoy shopping, Nottingham is perfect for you; independent boutiques and vintage shops in the bohemian area of Hockley mix with high street names in our large shopping centres to make Nottingham a veritable shopping haven.

Find out more: www.nottingham.ac.uk/nottinghamlife

Download our city guide: www.nottingham.ac.uk/go/cityguide

Nottingham city centre is always buzzing with people and interesting sights.



Applying for a place

We are looking for students who have the ability and motivation to benefit from our courses, and who will make a valued contribution to the school and the University. Candidates for full-time admission are considered on the basis of their Universities and Colleges Admissions Service (UCAS) form. For more information on how to make your application stand out, have a look at our online prospectus:

www.nottingham.ac.uk/ugstudy/applying

Application process

All applications for an undergraduate place to study at The University of Nottingham (including applications by overseas students) must be made through UCAS. Applications should be made online at www.ucas.com. Candidates will be notified of decisions through UCAS Track at track.ucas.com

For tips and advice at every step of your application journey, visit our undergraduate applicants' area: www.nottingham.ac.uk/ugapplicants

Your personal statement

This is the section of your UCAS form that tells us most about you, and you should make the best use of it. Be as specific and detailed as you can – we would like to see that you are a student who can work hard, be self-motivating and make the best possible use of the opportunities this course might have to offer you.

Required subjects

Most applicants will have studied three or more A Levels and will be required to achieve a minimum of 5 GCSE's at grade B including Maths, English and a Science. The school operates an offer range generally based on grades in three A levels, please see page 8 for more details. Most subjects are accepted with a small number of exceptions (currently general studies and critical thinking).

While it is preferred, we do not require you to have studied computer science or computing A levels and we recognise that some schools and colleges offer limited support for this subject.

Alternative qualifications

In this brochure you will find our A level entry requirements but we accept a much broader range of qualifications. These include:

- Access to HE Diploma
- Advanced Diploma
- Advanced GNVQ/Vocational A Levels
- BTEC Extended Diploma/OCR National Extended Diploma – 18 units
- BTEC HND/HNC
- European Baccalaureate
- International Baccalaureate
- Irish Leaving Certificate
- Scottish Advanced Highers
- UK Accredited International Foundation Programmes
- Welsh Baccalaureate

This list is not exhaustive; we will consider applicants with other qualifications on an individual basis.

The entry requirements for alternative qualifications can be quite specific; for example you may need to take certain modules and achieve a specified grade in those modules. Please contact us to discuss the transferability of your qualification.

Flexible admissions policy

In recognition of our applicants' varied experience and educational pathways, we employ a flexible admissions policy. If we judge that your situation has adversely affected your achievement, then we will consider this when assessing your academic potential. If you wish to mention information about your experiences in your personal statement, then you should ask the teacher or tutor writing your reference to confirm what you have written. We may ask for further evidence and may consider a range of factors. For more information, please see www.nottingham.ac.uk/go/admissionspolicies

Mature applicants

We encourage applications from mature students (which means all those aged 21 or over when the course begins). You should apply in the normal way through UCAS. While we accept a range of qualifications, you should check our specific requirements on UCAS course entry profiles. If in doubt, please contact the admissions tutor, who will be happy to answer any specific queries you have about applying as a mature student. Please email your questions to the team at admissions@cs.nott.ac.uk

For more information about being a mature student, please see www.nottingham.ac.uk/mature

International applicants

We welcome applications from international students and have students from many parts of the world studying with us at undergraduate and postgraduate level. All international candidates for undergraduate courses should apply through UCAS. The University's International Office offers guidance and advice on matters such as visa and immigration regulations, working and living in the UK, entry requirements and preparing for coming to Nottingham – and arranges a Welcome Programme for new international students each September. If you would like to visit the University and are unable to attend an open day, the International Office will be happy to arrange an individual visit for you. For further information please visit www.nottingham.ac.uk/studywithus/international-applicants

English language requirements

IELTS 6.5 (no less than 6.0 in any element) For more information and a list of the alternative English language requirements we accept, please see www.nottingham.ac.uk/go/alternativerequirements

Preparing to study in English – academic English preparation and support

The University of Nottingham Centre for English Language Education (CELE) offers high-quality academic English and study skills (preessional) programmes to prepare you to study your degree in English. Our programmes are designed to give international students excellent preparation for their academic studies and are taught by experienced, professional tutors.

CELE provides a range of programmes throughout the year, including five-week subject-specific courses (in some subjects) and a four-week course in September for students with unconditional offers, with a focus on academic study skills.

You can continue to benefit from academic English support with free classes and one-to-one consultations throughout your study (inessional programmes).

For more information about CELE, please visit www.nottingham.ac.uk/cele

Deferred entry

Applicants who wish to defer their entry by a year will not be at a disadvantage. Please tell us something about your plans for your gap year in your UCAS personal statement.

Equal opportunities policy

The University aims to create the conditions whereby students and staff are treated solely on the basis of their merits, abilities and potential, regardless of gender, race, colour, nationality, ethnic or national origin, age, socio-economic background, disability, religious or political beliefs, trade union membership, family circumstances, sexual orientation or other irrelevant distinction.

Frequently asked questions

How much are the fees?

Like many universities in England, Nottingham charges full-time UK and EU students an annual tuition fee of £9,000. However, you will not have to pay your fees while studying – the government will lend eligible students the money, which you will start to pay back once you have left university and are earning at least £21,000. For more information, please see

www.nottingham.ac.uk/fees

Fees for students from outside the EU vary from subject to subject. For more information, please see the 'New international students' section on www.nottingham.ac.uk/fees

What bursaries are available?

Although bursary figures for 2016/17 are yet to be finalised, the University will continue to offer a generous package of bursary support to students from lower income households. These are in addition to any support you may receive from the government. For more information please see www.nottingham.ac.uk/financialsupport

If you are an international applicant (outside of the EU), please see the 'New international students' section on www.nottingham.ac.uk/fees

The school offers generous scholarships for high achieving UK and international A level students. The details can vary from year to year but are typically worth between £1,000 and £3,000 in the first year. We also have some high performing scholarships for our current students worth £1,000. For more details please visit www.nottingham.ac.uk/computerscience/feesandfunding

What support do you offer for students with disabilities?

We are committed to promoting access for students who have a disability, dyslexia or a long-term medical condition. Services provided by the University aim to enable students to fulfil the inherent requirements of the course as independently as possible. The University's Disability Statement, which lists services, facilities and opportunities available throughout the University can be viewed at

www.nottingham.ac.uk/disability

What support is available for students with children?

There are a range of services provided to support students with children, including a University day nursery, a playscheme and playcentre day care.

There is also a scheme to help students fund childcare. For more information, see www.nottingham.ac.uk/child-care

Should I bring my own computer?

We provide full external remote desktop access to the computer science teaching environment, which allows students to use their own personal devices. This creates flexibility for students to use one device for all purposes. However, there are also 24hr computer facilities throughout the University, including in the School of Computer Science on Jubilee campus. In addition, University accommodation comes equipped with internet access allowing further flexibility when bringing your own computer or device.

Visit our website for more frequently asked questions: www.nottingham.ac.uk/faqs

There are plenty of places for individual study in and around the Computer Science Building.



