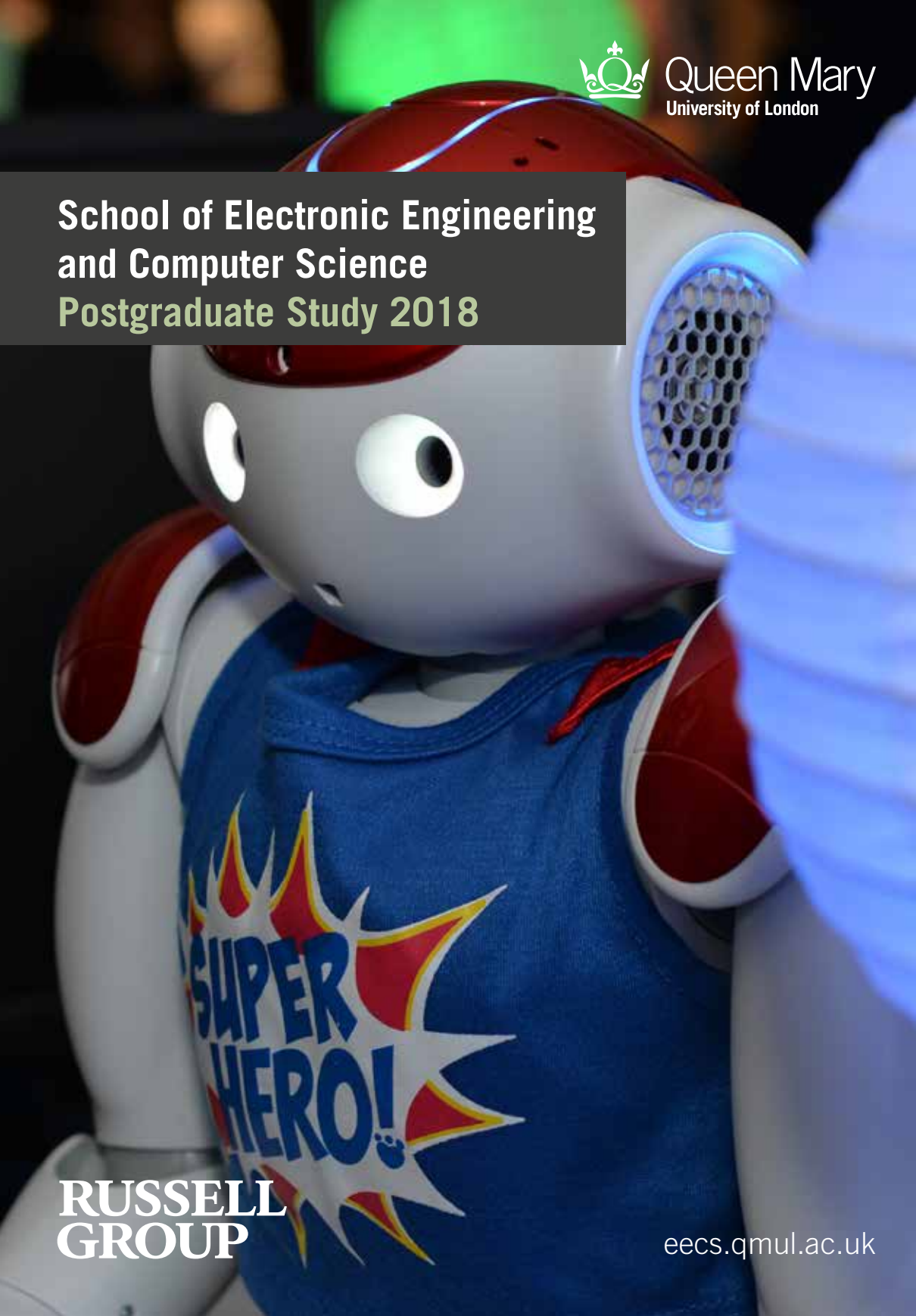


Queen Mary
University of London

# School of Electronic Engineering and Computer Science

## Postgraduate Study 2018

RUSSELL GROUP

eecs.qmul.ac.uk

Developed by Dr Andrew McPherson, the magnetic resonator piano (MRP) is a hybrid acoustic-electronic instrument augmenting the grand piano. The MRP allows the performer to continuously shape the sound of every note

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The Queens' Building, Mile End, has a proud association with not one, but four queens: Queen Victoria; Queen Mary (wife of King George V); Queen Elizabeth The Queen Mother; and our Patron, Queen Elizabeth II

## QMUL highlights

- 9th in the UK among multi-faculty universities (Research Excellence Framework 2014)
- 162 nationalities among students and staff making us one of the world's most diverse universities (December 2016)
- Brand new £39m Graduate Centre with dedicated space for postgraduates
- £137m research income (2015/16)
- More than 550 masters students benefited from scholarships in 2016/17
- 130 years of education, support and success in the capital (est. 1887)
- One of the largest residential campuses in London at Mile End
- Member of the Russell Group of leading UK universities.

# Welcome to Queen Mary University of London (QMUL)

Queen Mary has been at home in the East End since 1887. Starting out as a Victorian ideal, our founders aspired to create a place where everyone would have access to the same opportunities in education, recreation and culture – regardless of background.

We've continued to grow throughout our 130 years, opening centres across the city and bringing students and staff together to study from all over the world. One of the first colleges to provide higher education to women, Westfield College, joined us in 1989, and the internationally distinguished medical colleges of St Bartholomew's and the Royal London Hospitals combined to form our own medical school in 1995.

Today, we are one of the UK's top research universities and our postgraduate programmes offer a chance to explore subjects as diverse as the world in which we live. We would love for you to become a part of our story.

### Come and share our knowledge

We know our postgraduate students are passionate about their subjects. In the tradition of our early expansion, we've continued to develop degrees across our world-leading expertise, from humanities and social sciences to medicine, dentistry, science and engineering. Our programmes are directly informed by our academics' latest research. As professionals, they work side-by-side with industry, government, business, communities and charities. In doing so, they understand the demands of modern-day society and can, in turn, share their insights with you.

### Become a part of the capital

We retain close links with our local communities across London and remain dedicated to public good. We are an intrinsic part of east London, and have five campuses across the capital. Set beside the beautiful and historic Regent's Canal, our main site at Mile End is one of the largest residential campuses in the city and is home to our new £39m Graduate Centre. With the City of London to our west, the Queen Elizabeth II Olympic Park to our east, Canary Wharf and Docklands to our south and beautiful Victoria Park to our north, you'll be in the perfect position to explore the capital.

### Meet us – in person or online

Our Postgraduate Open Evenings offer you the chance to explore our campus and meet our tutors and students. If you can't visit in person, don't worry; we run Postgraduate Virtual Open Days online too. We also have representatives in 51 countries and staff who regularly travel overseas. For more information and a list of open events, see page 55 or qmul.ac.uk/postgraduate/meet-us

# Join Queen Mary and become a part of our story

**Love London**
Immerse yourself in a capital city

**Explore your passion**
Work side-by-side with top academics

**Join a global community**
Meet people from across the world

**Empower others**
Contribute to society

**Advance your career**
Stand out in a competitive jobs market

View from our Mile End campus

# Why choose us?

The School of Electronic Engineering and Computer Science has grown out of some of the oldest departments of their kind in Britain. We are proud of this history of innovation, but our passion is for the future. Our pioneering research, award-winning teaching and innovative approach to public engagement are what make us special.

## Our research-led approach

You will be taught by leading academics who are actively engaged in research. We work on core developments and novel technologies, making meaningful and long-lasting contributions that help to solve real-world problems. We have:

- 150 members of academic and research staff
- 3,100 students based in the UK and China
- 129 years of teaching electronic engineering and 46 years of teaching computer science.

Our researchers work with industry partners and academic colleagues around the world in a variety of sectors and disciplines. Our research has left indelible marks in areas as diverse as the foundations of programming languages, digital signal processing, parallel computing, graphene applications, internet and network quality, augmented human interaction, body-centric wireless communications and networks, and intelligent systems.

## Our outstanding resources

Our students have access to our RIBA award-winning Informatics Teaching Laboratory (ITL), which offers more than 300 workstations, specialist software and powerful servers all interconnected by high-bandwidth networks. All the systems are accessible remotely, with wireless networking across the campus.

To support our research-led teaching, we also have specialist laboratories in multimedia, digital signal processing, antennas and electroencephalography (EEG), and network quality. You will have access to these to carry out your own research.

Media and Arts Technology students have access to our Augmented Human Interaction (AHI) laboratory, which combines pioneering technologies including full-body and multi-person motion capture, virtual and augmented reality systems and advanced aural and visual display technologies.

Some of the 'tech toys' students get to play with and explore include a dedicated mobile virtual reality (VR) and augmented reality (AR) resource including: a suite of HTC Vive headsets, Oculus Rift headsets, six 4k cameras and a 360° degree camera rig; Leap Motion sensors with VR mounts; headphones for independent head-tracking; Kolor video stitching software and prototyping equipment such as a Ricoh Theta camera, and Samsung Gear VR headset.

Music Boxes – the School, along with students from Hunan University (China), developed these interactive artifacts inspired by the Dong ethnic minority culture during a 10-day innovation challenge in rural China

**"Studying for a masters is a big step up from undergraduate study, but it's fantastically rewarding for those that have a real passion for the subject – it's great to see people graduating each year, fired up to start new careers and apply new skills"**

**Dr Matthew Purver, Reader in Computational Linguistics**

# Why choose us?

## Our links with industry

Our students benefit from our strong links with industrial partners. We have collaborations, partnerships, industrial placement schemes and public engagement programmes with a variety of organisations, including Samsung, Google, IBM, Goldman Sachs, NASA, BBC and Microsoft.

We nurture and foster an entrepreneurial spirit among our staff and students. We've been home to a number of original research ideas that have subsequently become successful spin-out companies, including:

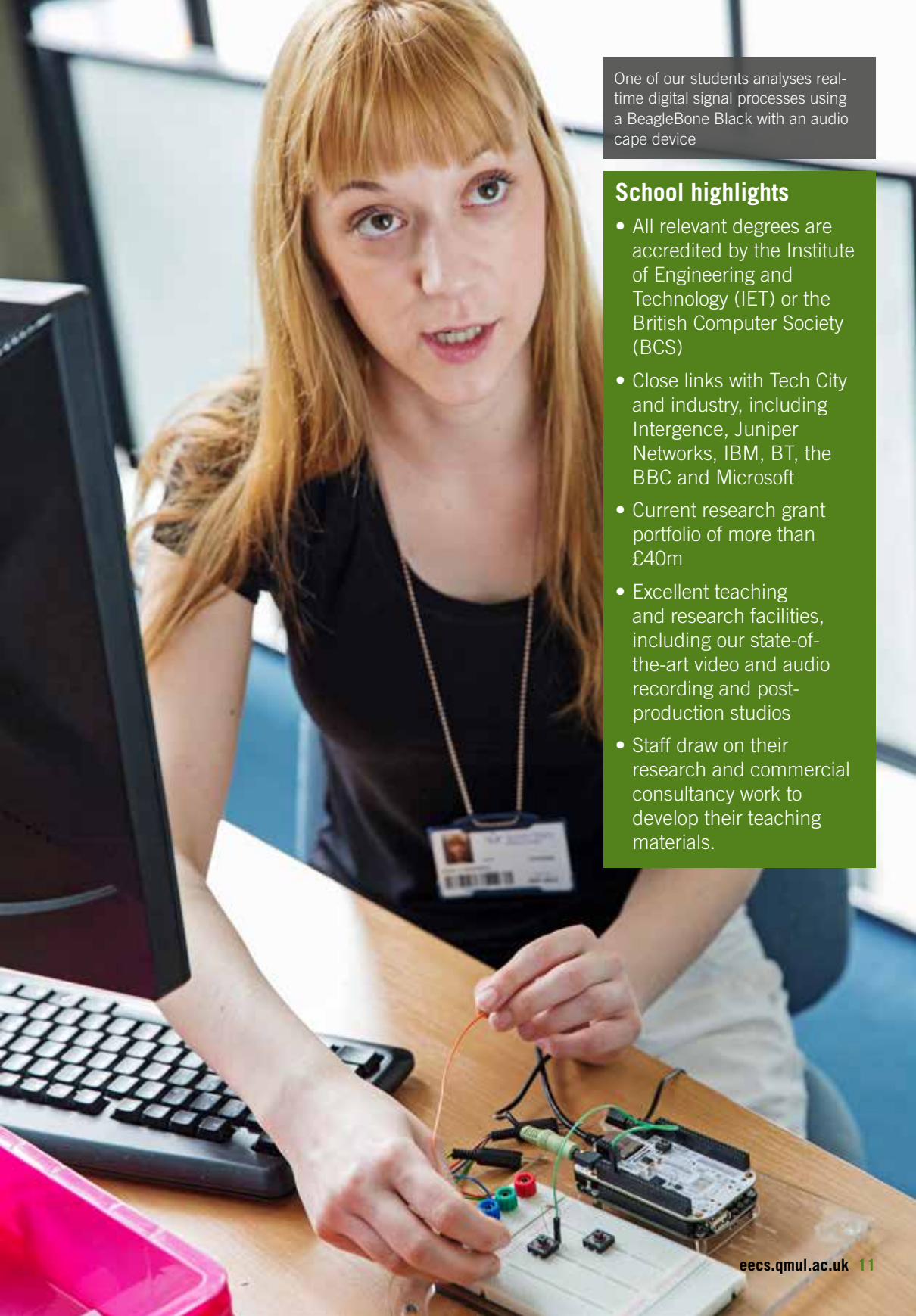
- Actual Experience plc – assesses how well network-based services perform, providing services for a range of organisations from large blue chips to governmental organisations
- Agena Ltd – provides risk management software for a range of major clients including NASA, US Strategic Command, GE Healthcare, Procter & Gamble, Boeing, VocaLink, Milliman, Partnership Life Assurance, and the World Agroforestry Centre
- Chatterbox Labs Ltd – provides natural language processing software to understand brand-related discussions
- Monoidics Ltd – specialises in automatic verification tools detecting errors in software systems, and was bought by Facebook in 2013
- QApps – provides smartphone and social networking apps
- Vision Semantics Ltd – develops software to manage facilities and enhance security.

## Choosing your MSc programme

Our main programmes are intended for applicants with an undergraduate degree in computer science or electronic engineering: see computer and data science (page 16) and networks and internet of things (page 30).

However, we also offer programmes designed for applicants with a broader range of backgrounds, including those with unrelated degrees – such as those in the arts and humanities – who are interested in converting to a career in computing and IT-related fields:

- Computing and Information Systems MSc (page 22) is for applicants new to computer science with a background from non-technical areas.
- Electrical and Electronic Engineering MSc (page 30) is for applicants new to these disciplines, but who have a background in maths or science.
- Big Data Science MSc (page 16) is for applicants with experience in either computer science or a mathematically oriented field.
- Media and Arts Technology by Research MSc (page 44) is for applicants with experience in a science, engineering or a design-oriented discipline.
- Internet of Things MSc (pages 34–35) brings together aspects of computing, electronics, networks and artificial intelligence (AI) and is open to applicants with a background in any of these related topics.
- Cognitive Science MSc (pages 42–43) combines computer science, linguistics and psychology and is open to applicants with backgrounds in any of these areas.



One of our students analyses real-time digital signal processes using a BeagleBone Black with an audio cape device

## School highlights

- All relevant degrees are accredited by the Institute of Engineering and Technology (IET) or the British Computer Society (BCS)
- Close links with Tech City and industry, including Intergence, Juniper Networks, IBM, BT, the BBC and Microsoft
- Current research grant portfolio of more than £40m
- Excellent teaching and research facilities, including our state-of-the-art video and audio recording and post-production studios
- Staff draw on their research and commercial consultancy work to develop their teaching materials.

# Careers and alumni

Whether you are mid-career looking for your next move or a recent graduate wanting to explore your subject in more depth, one of our postgraduate qualifications can give you an edge in today's competitive job market.

There is currently a shortage of highly qualified graduates in computer science and electronic engineering, meaning there are lots of exciting career opportunities for graduates with the right skills.

Your future plans may involve working on the research and development of new technologies and applications – either in the laboratories of a large manufacturer or in a smaller contract research and development company, where you would be able to work with a variety of clients. Alternatively, you may prefer to work on large projects that require organisational skills and leadership, with the potential to lead on to senior project and company management.

We work closely with partners to ensure our graduates are more than ready for developing a successful career. Nearly all our programmes are accredited by the Chartered Institute of IT(BCS) and the Institute of Engineering and Technology (IET) up to entry in 2020. Please check our website for the most up-to-date information for individual programmes eecs.qmul.ac.uk/pg-professional-accreditation.

## How we can help

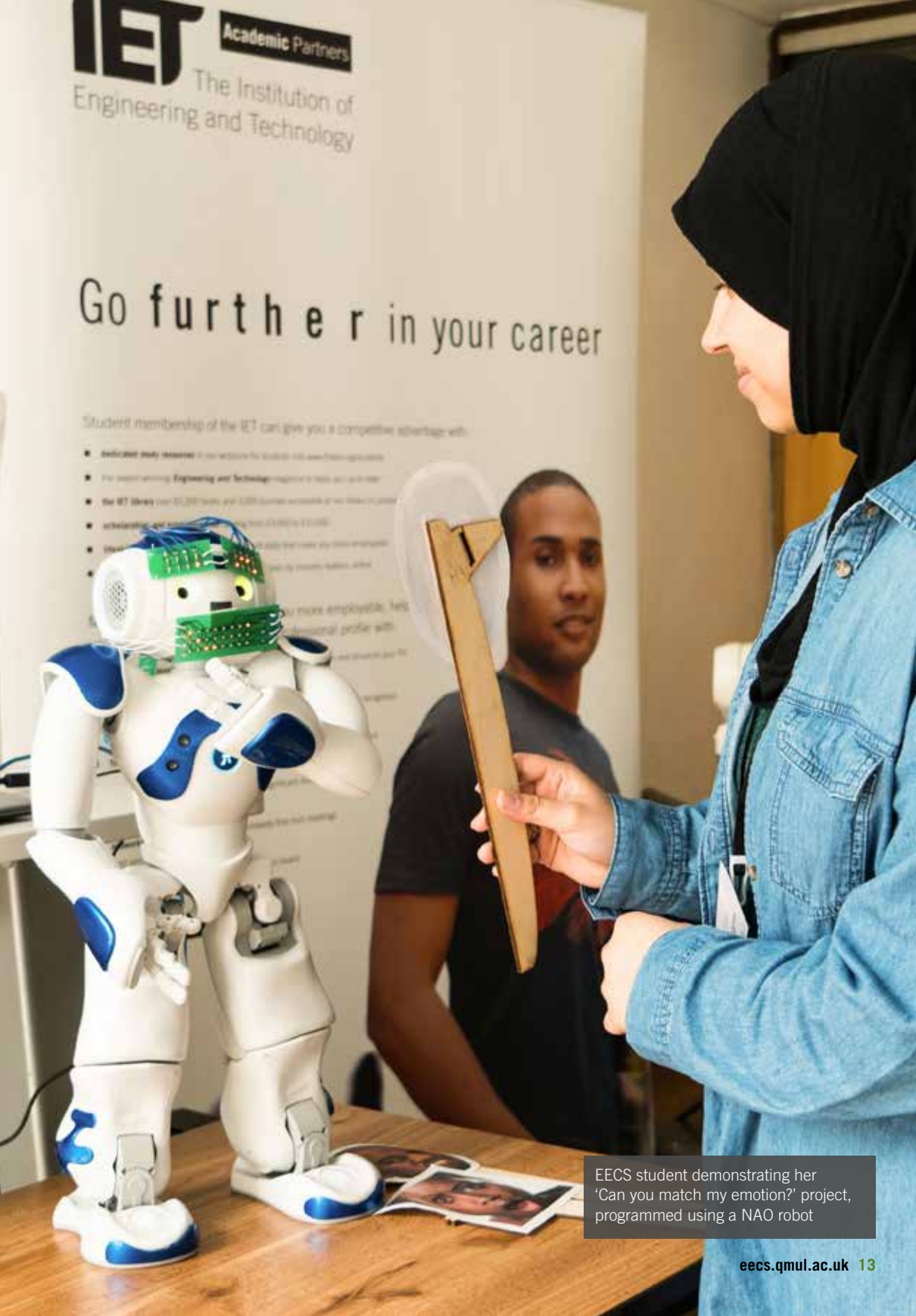
Our strong links with industry through our research collaborations, industrial placement and degree apprenticeships programmes have helped our students find graduate opportunities. Help is also available from the QMUL Careers and Enterprise Centre, as well as our dedicated specialist Industrial Placement Manager.

Samsung, Amazon, Facebook, IBM and Microsoft Research are just some of our current partners. We work with them on collaborations, partnerships, student industrial placement schemes and public engagement programmes.

## Industrial experience programme

We offer an industrial experience option on all our full-time taught MSc programmes, combining academic study with a one-year industrial placement.

Taking this option as part of your degree will give you a chance to apply your skills in a professional context. Although we cannot guarantee a placement (employers conduct their own application and interview processes), we provide help to identify suitable opportunities and, as a leading research School, we have excellent links with industry. We can also help you with writing your job applications and preparing for interviews.




EECS student demonstrating her 'Can you match my emotion?' project, programmed using a NAO robot

# Careers and alumni

If you are an international student, the placement option also allows you to get valuable UK work experience; as well as this, registering for a degree with industrial experience will mean your student visa will cover the duration of your two-year course.

Recent graduate destinations:

- Computing Analyst, Bank of America Merrill Lynch
- Electronic Engineer, TfL
- IT Infrastructure Support, Octavia Housing
- Analytics Consultant, Accenture
- Network Engineer, Huawei Technologies
- Senior Engineer, Qualcomm

## Careers support

QMUL's Careers team can work with you to support your career planning and to connect you to employers through their fairs and events. Services include:

- one-to-one appointments to help with career direction, to review your skills and experience to-date, to give advice on job applications, to offer insight into the job market and to give mock interview preparation
- tailored workshops for career preparation and job hunting
- employer-led events focusing on sectors relevant to your knowledge or area of interest
- recruitment support for internships, part-time jobs and work placements.

## Enterprise support

Many students and graduates across Queen Mary start new or grow existing business and social ventures each year. QMUL's Enterprise team can help you with support through:

- funding
- one-to-one advice and workshops
- workspace
- access to experts and entrepreneurial networks.

Visit: careers.qmul.ac.uk

### Alumni profile: Zhanelya Subebayeva

**Studied:** Computer Science MSc 2015

**Currently:** IT Developer, Alan Blunden & Co Ltd

**What did you enjoy about your time at QMUL?**

Being a student in London opens a vast range of possibilities of what you can learn and what you can do in the city. Being London-based helps you to kick-start your career straight after your studies, and also get valuable life experience of living in a different city. Queen Mary has good computer facilities, and a great career advice service, thanks to which I was able to make my CV attractive to the job market.

**How has your degree from QMUL helped your current career?**

Obtaining an MSc degree at Queen Mary gave me an advantage against many other job seekers because it is a Russell Group university, and having a masters degree is quite desirable to recruiters.


Dr Eliane Bodanese, Senior Lecturer

"I lead research into developing rapid and resilient communications between civilian mobile devices and outside agencies (eg paramedics) in remote regions. Challenges lie in creating self-forming and self-configuring networks using smartphones and sensors when no infrastructure exists: for example, in mountain areas containing 'dead' zones blind to radio and cellular radio communications"

Dr Eliane Bodanese, Senior Lecturer"

# Our masters programmes

## Computer and data science

### Big Data Science MSc

**One year full-time, two years part-time, two years full-time with industrial experience**

qmul.ac.uk/msc-big-data

**Key themes:** Data analytics, machine learning, big data processing, cloud computing, statistical methods

This programme is designed for those who want to pursue a career as data scientists, deriving valuable insights and business-related information from large amounts of data.

#### Overview

The big data science movement is transforming how internet companies and researchers all over the world address traditional problems. Big data refers to the ability to exploit the massive amounts of unstructured data that are generated continuously by companies, users and devices, and extract key understanding from them. The job market has a current shortage of trained professionals with this set of skills, and demand for data scientists is expected to increase significantly in future years.

The programme leverages expertise in research with our strategic partnership with IBM and other leading companies in the IT sector. It is taught by academics from the Networks, Centre for Intelligent Sensing, Risk and Information Management, Computer Vision and Cognitive Science research groups: a team of more than 100 members performing world-leading research.

You will cover the fundamental statistical (eg machine learning) and technological tools (eg cloud platforms, Hadoop) for large-scale data analysis.

#### Programme outline

Core modules

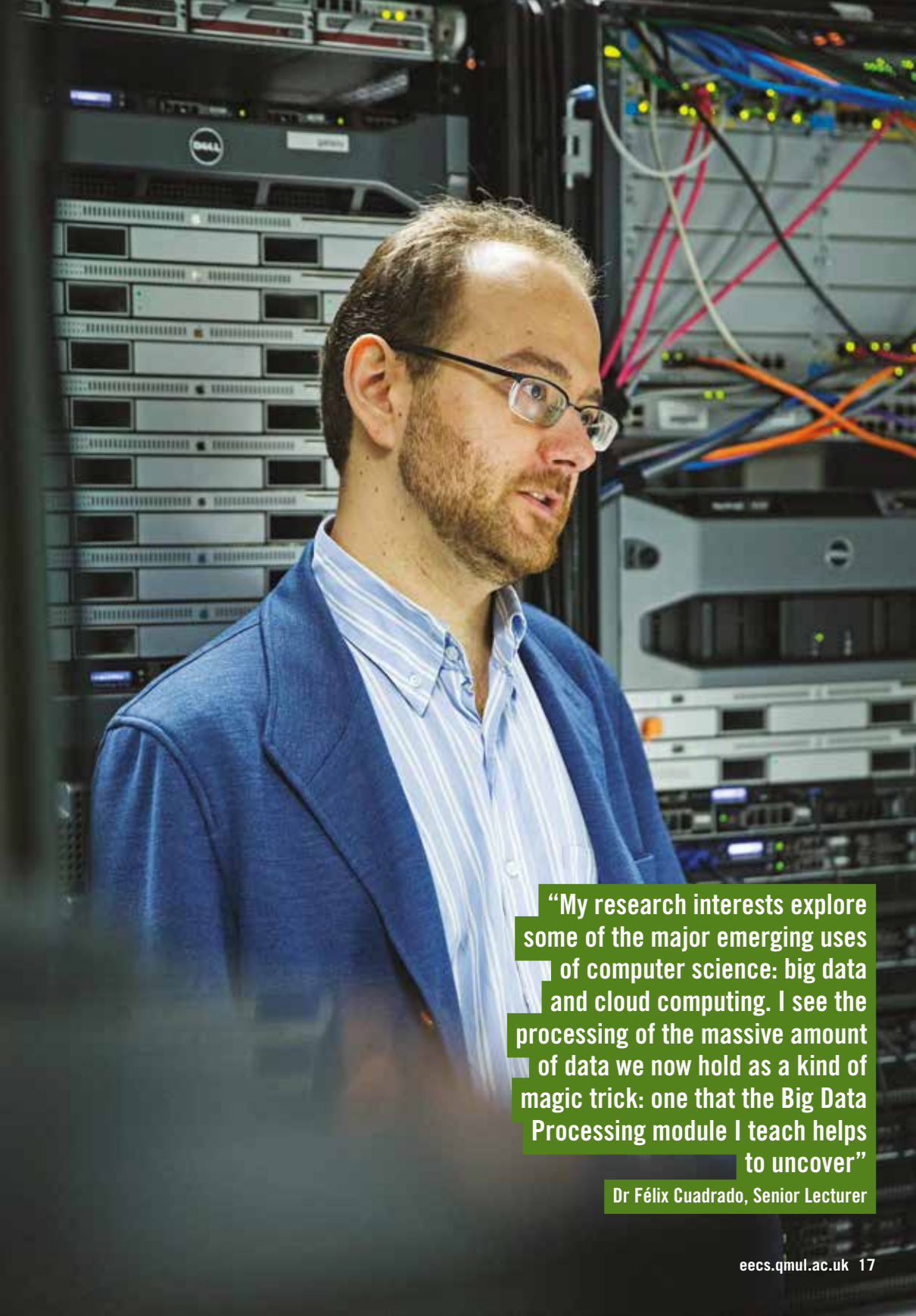
- Applied Statistics
- Big Data Processing
- Data Mining
- MSc Project module

Option modules

- Cloud Computing
- Data Analytics
- Digital Media and Social Networks
- Deep Learning and Computer Vision
- Introduction to the Internet of Things
- Introduction to Object-Oriented Programming
- Machine Learning
- Natural Language Processing
- Semi-structured Data and Advanced Data Modelling
- Machine Learning for Visual Data Analysis
- The Semantic Web

#### Who is this programme suitable for?

This programme is suitable for students who have previously studied computer science, maths or related topics, or who have significant relevant work experience.



"My research interests explore some of the major emerging uses of computer science: big data and cloud computing. I see the processing of the massive amount of data we now hold as a kind of magic trick: one that the Big Data Processing module I teach helps to uncover"

Dr Félix Cuadrado, Senior Lecturer

# Our masters programmes

## Computer and data science

### Computer Science MSc

**One year full-time, two years part-time, two years full-time with industrial experience**

qmul.ac.uk/msc-comp-sci

**Key themes:** software development, advanced data modelling, parallel systems, data mining, NoSQL databases, machine learning

The demand for better products and commercial services drives the search for creative solutions using computing based systems, and has also established a dependence between computing and practically every other industry and sector. This flexible programme offers a broad range of advanced study options, reflecting the emerging technologies in industry.

#### Overview

You can shape your programme to match your interests and career ambitions, choosing modules from a range of areas including the development of human–computer communications (dialogue systems), ubiquitous computing, applying interactive digital multimedia techniques, security and surveillance.

This is a multidisciplinary programme and, in addition to pure computer science modules, you can choose options where computer science intersects with other fields and build on your undergraduate degree.

### Programme outline

Core modules

MSc Project module
And a further two from:

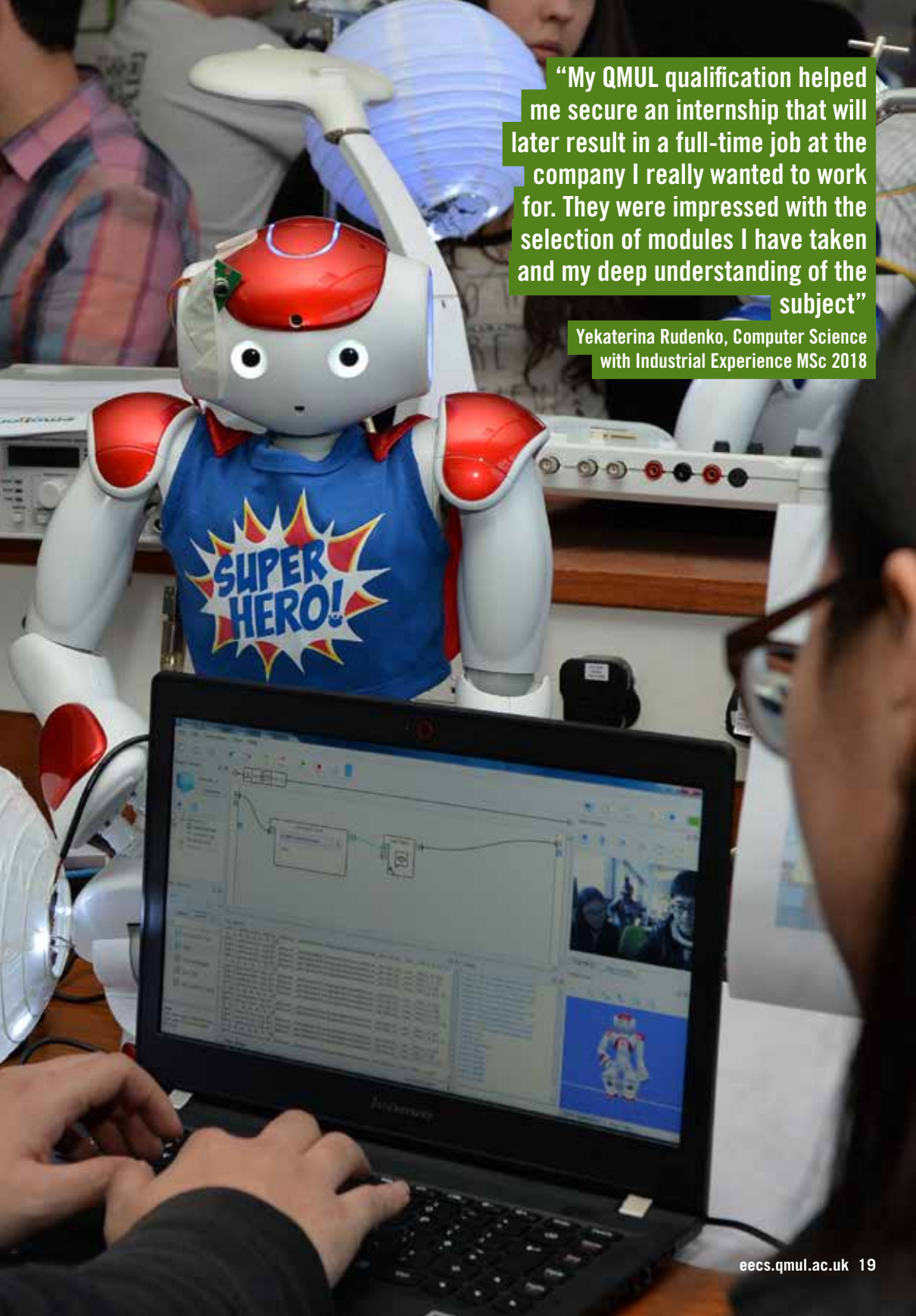
- Bayesian Decision and Risk Analysis
- Functional Programming
- Interactive Systems Design
- Introduction to Object-Oriented Programming
- Security and Authentication
- Semi-structured Data and Advanced Data Modelling

Option modules

- Advanced Object Oriented Programming
- Big Data Processing
- Business Technology Strategy
- Cloud Computing
- Data Analytics
- Design for Human Interaction
- Foundations of Intellectual Property Law and Management
- Information Retrieval
- Introduction to Computer Vision
- Introduction to Law for Science and Engineering
- Machine Learning
- Mobile Services
- Natural Language Processing
- Parallel Computing
- Program Specifications
- Real-Time and Critical Systems
- Software Analysis and Verification
- Techniques for Computer Vision
- The Semantic Web

### Who is this programme suitable for?

This programme is suitable for students who have previously studied computer science, maths or related topics, or who have significant relevant work experience.




"My QMUL qualification helped me secure an internship that will later result in a full-time job at the company I really wanted to work for. They were impressed with the selection of modules I have taken and my deep understanding of the subject"

Yekaterina Rudenko, Computer Science with Industrial Experience MSc 2018

# Our masters programmes

## Computer and data science

### Computer Science by Research MSc

**One year full-time, two years part-time**

qmul.ac.uk/msc-comp-sci-research

**Key skills:** research methods, in-depth focused project, independent study, publishable research

This MSc involves an extended individual research project carried out as part of one of our established research groups, combined with selected taught modules.

#### Overview

This programme offers you the chance to undertake an advanced masters programme through an extended research project. The programme is suitable for outstanding students who have an interest in advanced research-based study in one of our specialisms: Computer Vision, Cognitive Science, Risk and Information Management, Game AI, Computational Creativity, and Theoretical Computer Science.

The expectation is that every graduate from the degree will publish at least one conference paper as part of their research. The MSc by Research programme will give you solid theoretical and practical research competences in your chosen field of study and will enhance your employability. Successful completion of the programme may also provide a route to further study at doctoral level or for a research position in industry.

#### Programme outline

- You will join one of our research groups, completing an extended research project
- You will take four taught modules, chosen from any of the modules offered in the School, in line with what is most appropriate for your chosen research project.

#### Teaching and assessment

- Teaching for all modules includes a combination of lectures, seminars and a virtual learning environment
- Taught modules are assessed through a combination of coursework and written examinations
- The individual MSc Research Project will be conducted under close supervision throughout the academic year, and is evaluated by thesis, presentation and viva examination.

#### Who is this programme suitable for?

This programme is suitable for students who possess a good honours degree (minimum upper second-class) in computer science, maths or related topics.

"We have logicians, theorists, and people working with music and cognitive science all in one stretch of the corridor. It's so refreshing to go to seminars with lots of maths in them and seminars when an artist analyses a piece of experimental music for you"

Dr Mehrnoosh Sadrzadeh, EPSRC Career Acceleration Fellow and Lecturer

# Our masters programmes

## Computer and data science

### Computing and Information Systems MSc (conversion programme)

**One year full-time, two years part-time, two years full-time with industrial experience**

qmul.ac.uk/msc-comp-info-sys

**For graduates of non-computing disciplines**

**Key themes:** software development methods, object-oriented programming, interactive system development and evaluation, mobile services, network planning, information systems for business

Graduates who are able to fully exploit the potential of computing and information systems by combining specialist technical skills with other knowledge and experience are highly sought after. If your undergraduate degree contained little or no technical experience, but you're now looking to change direction or enhance your employability by developing your skills in this area, then this programme (commonly referred to as a 'conversion course') is for you.

#### Overview

Guided by academics with a wealth of industrial experience, this is an intensive one-year MSc programme for highly motivated graduates with a good honours degree, but with little prior experience of computer science. You will develop your theoretical knowledge and practical technical development skills through extensive training in the subjects at the heart of computing, including object-oriented programming (using Java), database systems, and information systems (covering system design, networking and computer architecture).

You will be able to extend your areas of technical expertise to specialist areas by choosing from a variety of option modules, such as Mobile Services, Business Technology Strategy, and Graphical User Interfaces.

You can personalise your programme to follow a technical or business route, developing practical and theoretical skills that will be highly relevant in today's job market.

#### Programme outline

Core modules

- Database Systems
- Information Systems (double module)
- IT Programming (double module)
- MSc Project module

Option modules

- Bayesian Decision and Risk Analysis
- Business Information Systems
- Business Technology Strategy
- Cloud Computing
- Distributed Systems and Security
- Graphical User Interfaces
- Introduction to the Internet of Things
- Mobile Services
- Security and Authentication

#### Who is this programme suitable for?

This programme is suitable for students who are not coming from a Computer Science background. You may have previously studied a subject not related to Computer Science, or a degree with less than 50 per cent of the modules in computer science.

"Computer Science is a constantly evolving subject and I enjoyed being challenged with new problems and having the chance to learn about the latest developments in my studies. The final year project was my favourite part of the postgraduate degree, as I had the freedom to work independently and acquire knowledge in a subject I am enthusiastic about"

Aminah Sayed, Computer Science MSc 2014

# Our masters programmes

## Computer and data science

### Financial Computing MSc

**One year full-time, two years part-time, two years full-time with industrial experience**

qmul.ac.uk/msc-fin-comp

**Key themes:** mathematical modelling, GPU programming, portfolio management, risk analysis

Financial institutions rely on a blend of mathematics, technology and finance to develop, enhance and sustain their competitive edge. Run jointly with the School of Mathematical Sciences, this unique programme provides numerate graduates with the expertise needed to develop a professional career in the profitable and intellectually challenging triangle formed by mathematics, technology and finance.

The financial industry is undergoing a second wave of technological transformation related to new electronic trading platforms, improved risk management and pricing accuracy, and the high-performance computing implications of enhanced regulatory requirements. As a result, there is a high demand from investment banks, hedge funds, financial software companies, brokerage and consultancy firms for numerate and technologically capable graduates. Other types of businesses are also developing similar ways of working, where numerate, technologically able staff form an essential part of innovation and decision-making.

#### Overview

The Financial Computing MSc is aimed at science and engineering graduates with mathematical exposure and some experience in computer programming. The content of the programme is a combination of technology and financial mathematics.

### Programme outline

Core module

- Financial Computing MSc Dissertation

Compulsory modules

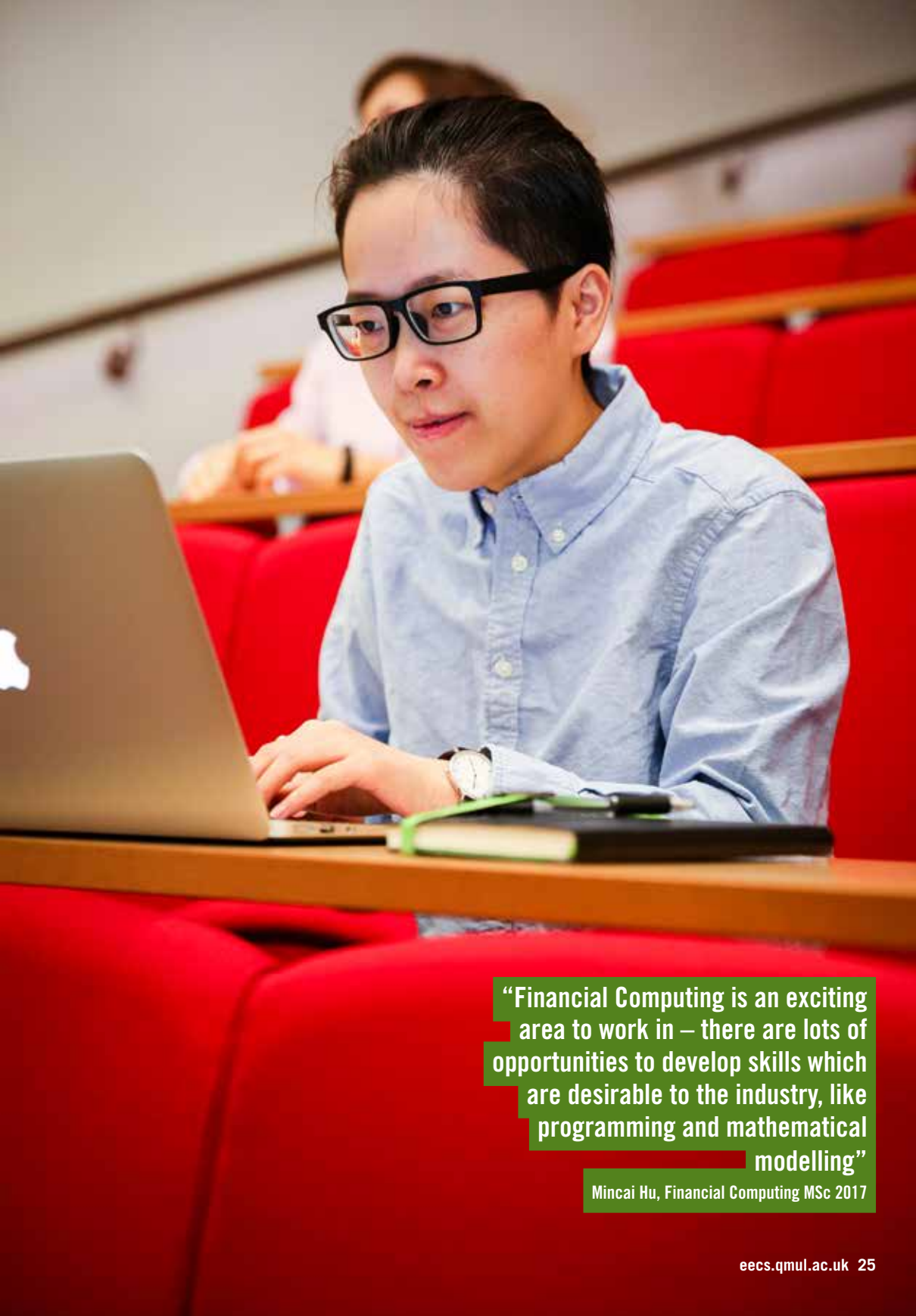
- Financial Programming
- Foundations of Mathematical Modelling in Finance
- Introduction to Object-Oriented Programming
- Topics in Scientific Computing

Option modules

- Advanced Computing in Finance
- Advanced Objected-Oriented Programming
- Big Data Processing
- Functional Programming
- Machine Learning
- Parallel Computing
- Portfolio Theory and Risk Management
- Stochastic Calculus and Black–Scholes Theory

### Who is this programme suitable for?

This programme is suitable for students who have previously studied a subject with some exposure to computer programming and some mathematical component: for example, computer science, mathematics, physics, statistics, or engineering.



**“Financial Computing is an exciting area to work in – there are lots of opportunities to develop skills which are desirable to the industry, like programming and mathematical modelling”**

Mincai Hu, Financial Computing MSc 2017

# Our masters programmes
## Computer and data science

### Machine Learning for Visual Data Analytics MSc
**One year full-time, two years part-time, two years full-time with industrial experience**
qmul.ac.uk/msc-machine-learning-vda

**Key themes:** machine learning, face recognition, surveillance systems, neural nets, intelligent imaging systems

How can we design smartphones that sense your mood by reading your facial expressions or recognising hand gestures as a way to make a call? And how do we develop systems that quickly and reliably analyse medical scans? Whether assisting with cancerous tumour diagnosis or improving the safety of self-driving cars with in-vehicle technology able to detect and modify a vehicle's behaviour – these are just some of the fascinating scenarios that you will explore while studying with our experts on this programme.

#### Overview
This programme is intended to respond to the growing shortage in research and industry of engineers with a high level of training in the analysis and interpretation of images and video. The MSc covers both low-level image processing and high-level interpretation using state-of-the-art machine learning methodologies. In addition, it also offers high-level training in the programming languages, tools and methods needed for the design and implementation of practical computer vision systems.

You will be taught by world-class researchers in the fields of multimedia analysis, vision-based surveillance, structure from motion, and human motion analysis. In addition to your lectures, you will be working on live research projects, developing hands-on experience.

#### Programme outline
Core modules

- Introduction to Computer Vision
- Machine Learning
- Machine Learning for Visual Data Analysis
- Deep Learning and Computer Vision
- MSc Project module

Option modules

- Artificial Intelligence
- Big Data Processing
- C++ for Image Processing
- Computer Graphics
- Data Mining
- Digital Media and Social Networks

#### Who is this programme suitable for?
This programme is suitable for students who have previously studied computer science, maths or related topics, or who have significant relevant work experience.

One of our students exploring eye data observation with a remote tracking camera to measure gaze direction and pupil diameter

# Our masters programmes

## Computer and data science

### Software Engineering MSc

**One year full-time, two years part-time, two years full-time with industrial experience**

qmul.ac.uk/msc-soft-eng

**Key themes:** robust software development, reliable systems, embedded, real-time systems, risk analysis, advanced programming, interface design and evaluation

Whether it's the computers in our offices, the smartphones in our pockets, the electrics in our cars or the technology that enables us to monitor patients in critical care, software is at the heart of our society. This MSc programme focuses on advanced theoretical and practical techniques in programme design, and the management of software project risk.

#### Overview

You will learn advanced techniques in programme design (including software patterns and component technologies) and information handling (structured information and databases). You will also cover vital areas such as security, specification, risk management, usability, and design integrity.

### Software Engineering and Security MSc pathway

If you are interested in this specialism, we have added a new security pathway using specific pre-requisite modules in our main Software Engineering MSc. Contact the School for more details.

### Programme outline

Core modules

- MSc Project module

And a further three from:

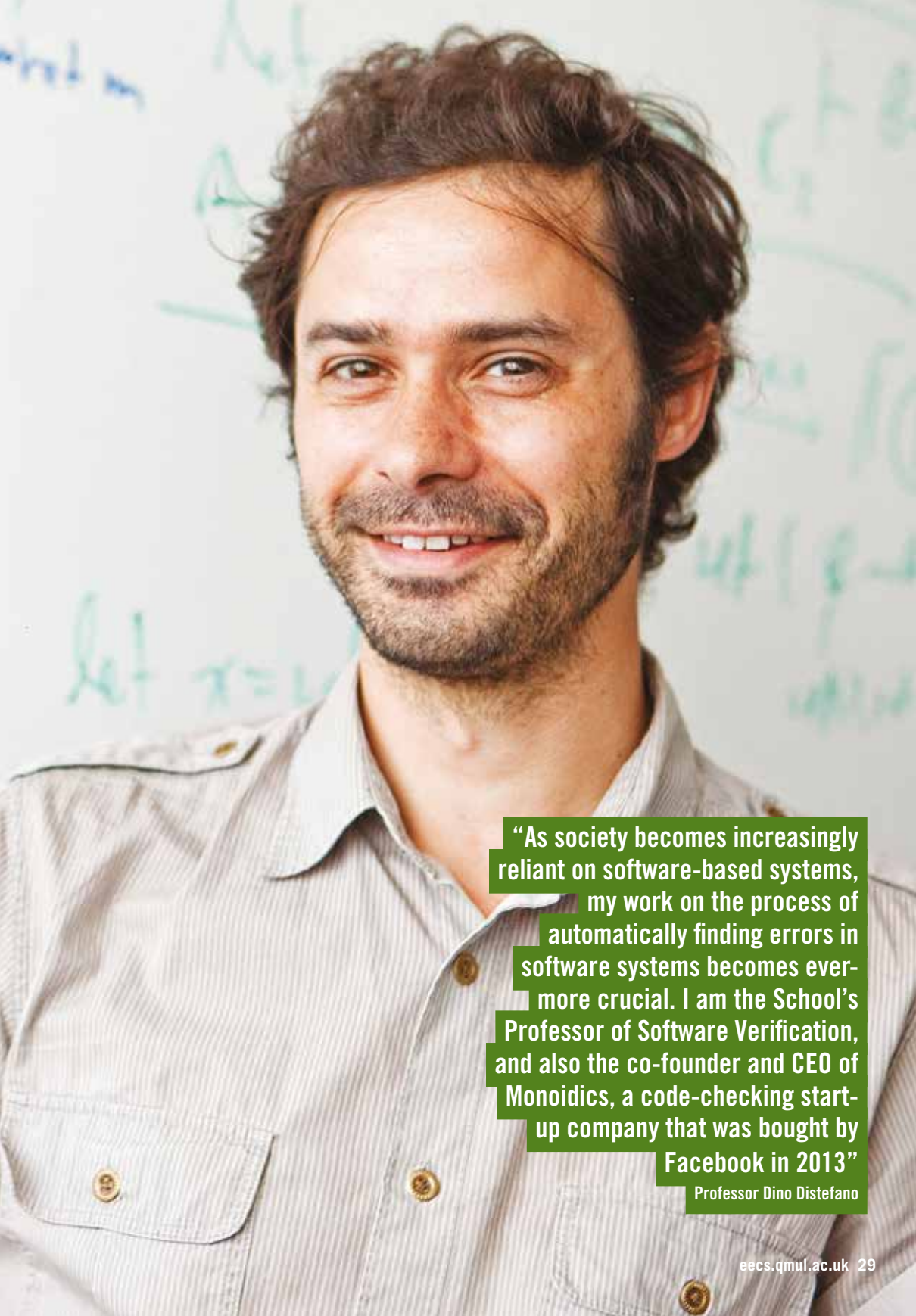
- Bayesian Decision and Risk Analysis
- Big Data Processing
- Functional Programming
- Interactive System Design
- Program Specifications
- Real Time and Critical Systems
- Software Analysis and Verification

Option modules

- Advanced Data Modelling
- Advanced Object Oriented Programming
- Cloud Computing
- Data Analytics
- Distributed Systems
- Introduction to the Internet of Things
- Introduction to Object-Oriented Programming
- Machine Learning
- Mobile Services
- Parallel Computing
- Security and Authentication
- Semi-structured Data and
- Techniques for Computer Vision
- The Semantic Web

### Who is this programme suitable for?

This programme is suitable for students who have previously studied computer science, maths or related topics, or who have significant relevant work experience.



"As society becomes increasingly reliant on software-based systems, my work on the process of automatically finding errors in software systems becomes ever-more crucial. I am the School's Professor of Software Verification, and also the co-founder and CEO of Monoidics, a code-checking start-up company that was bought by Facebook in 2013"

Professor Dino Distefano

# Our masters programmes

## Networks and internet of things

### Electronic and Electrical Engineering MSc (conversion programme)

**One year full time, two years part-time, two years part-time with industrial experience**

qmul.ac.uk/msc-eee-con

**Key themes:** electronic engineering for scientists, analogue and digital systems, control engineering

This conversion masters programme is designed for students with a science background who are looking to change direction and specialise in electrical and electronic engineering. It builds on the strengths of our world-leading research in networks, antenna design and electromagnetics, computer vision and computer theory.

### Overview

This conversion masters programme features a common first semester of analogue electronics, digital systems design (incorporating an online pre-sessional module in digital circuit design), control systems, and embedded systems (incorporating C programming). In the second semester, the electronic engineering stream features choices from advanced control systems, critical systems, integrated circuit design, and real-time DSP, while the electrical engineering stream features choices from bioelectricity, microwave and millimetre-wave communication systems, power electronics, and electrical power engineering. Both streams have a project or industrial project during the third (summer) semester.

### Programme outline

Pre-sessional course

- Digital electronics (new distance learning module)

Core modules

- Electronics
- Digital Systems Design
- MSc Project module/Industrial project

Option modules

- Advanced Control Systems
- Control Systems
- Digital Electronics
- Electrical Power Engineering
- Embedded Systems
- Integrated Circuit Design
- Microwave and Millimetre-wave Communication Systems
- Microwave and Millimetre-wave Electronics
- Power Electronics
- Principles and Applications of Bioelectricity
- Real-Time and Critical Systems
- Real-Time Digital Signal Processing

### Who is this programme suitable for?

This programme is suitable for students who are not coming from an electronic and electrical engineering background, but who have had some exposure to scientific components. You may have previously studied, for example, maths, physics, biology, chemistry or computer science, or a degree with less than 50 per cent of the modules in electronic and electrical engineering subjects.

**“The focus of my research in the Real-time Power and Control Laboratory is power converter technology and battery management systems for electrical vehicles. We are currently developing advanced and integrated control algorithms to increase the efficiency of novel dc-dc converters using high-switching silicon carbide devices, and to enhance the life-time of lithium-ion battery packs”**

**Dr Kamyar Mehran**
**Lecturer in Power Engineering**

Student groups are learning the principals of an induction motor using their electrical machine training set. Induction motors have numerous applications including electric vehicles and Dyson vacuum cleaners

# Our masters programmes

## Networks and internet of things

### Electronic Engineering by Research MSc

**One year full-time, two years part-time, two years full-time with industrial experience**

qmul.ac.uk/msc-elec-eng-res

**Key themes:** research methods, evaluation, performance, dissertation project, independent study, publishable research

On this programme, you will use theoretical and experimental research techniques to explore and create innovative technologies, enabling you to transfer your knowledge for practical application in the future.

#### Overview

An MSc by Research will provide you with the necessary skills to undertake research either in an academic or industrial environment. The expectation is that every graduate from the degree will publish at least one conference paper as part of their research. You will develop excellent technical skills, and will be able to demonstrate to employers your ability to undertake high-level independent research.

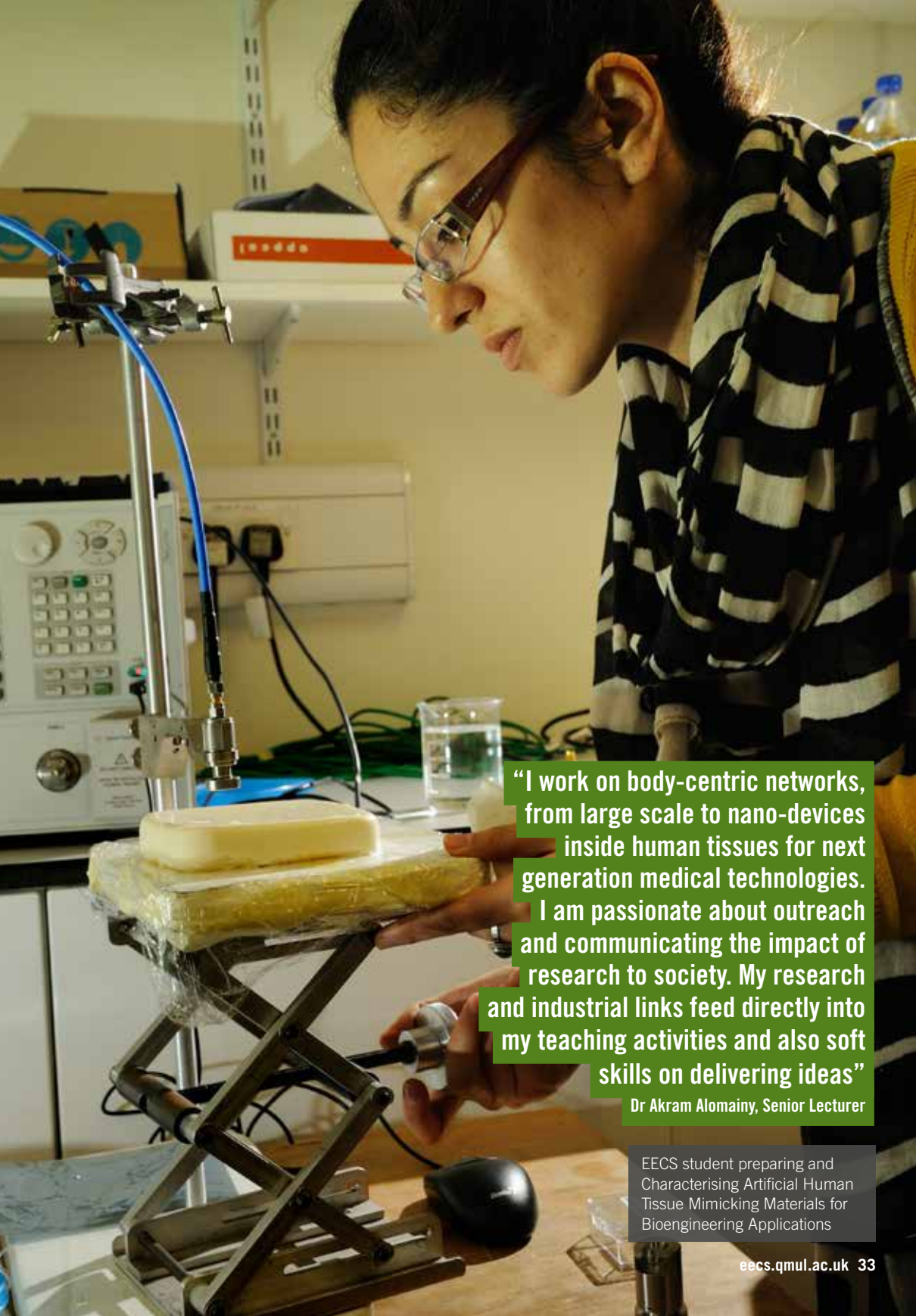
The programme is suitable for outstanding students who have an interest in advanced research-based study in one of our specialisms: Antennas and Electromagnetics, Centre for Digital Music (C4DM), Multimedia and Vision (MMV), and Networks. This programme is a pathway to a PhD, providing the necessary training to prepare for a career in research and development.

### Programme outline

- You will join one of our research groups, taking four selected taught modules and completing an extended research project
- You can choose four taught modules from any of the modules offered in the School, in line with what is most appropriate for your chosen research project
- Teaching for all modules includes lectures, seminars and a virtual learning environment
- Modules are assessed through a combination of coursework and written examinations.

### Who is this programme suitable for?

This programme is suitable for students who possess a good honours degree (minimum upper second-class) in electronic engineering, computer science, maths or a related discipline.



**"I work on body-centric networks, from large scale to nano-devices inside human tissues for next generation medical technologies. I am passionate about outreach and communicating the impact of research to society. My research and industrial links feed directly into my teaching activities and also soft skills on delivering ideas"**

**Dr Akram Alomainy, Senior Lecturer**

EECS student preparing and Characterising Artificial Human Tissue Mimicking Materials for Bioengineering Applications

# Our masters programmes

## Networks and internet of things

### Internet of Things MSc (three pathways: Data Processing, Engineering and Intelligent Sensing)

**One year full-time, two years part-time two years full-time with industrial experience**

qmul.ac.uk/msc-iot

**Key themes:** connected world, smart devices, wearables, smart environments, machine-to machine (M2M), smart cities, healthy living, intelligent tagging and sensing

A futuristic connected world where we could interact with smart objects – on-body, in buildings, in cities and in distant, harsher environments – was once science fiction. This is now a reality: parts of buildings can now interact with each other, smart vehicles can be autonomously controlled, and humans can interact with all of the above using smart phones and wearables. This innovative Internet of Things (IoT) MSc programme will help you to become one of the highly skilled and in-demand engineers who can fully exploit the potential that these technologies offer.

#### Overview

The Internet of Things (IoT) focuses on a vision of more connected, different, 'things' (or digital devices) than in previous visions of the internet. A greater number of 'things' become part of the physical world, connecting to form smart environments. Humans are constantly increasing the frequency and range of 'things' (sensors, tags, cards, phones, actuators, wearables) they interact with in the world.

Machine-to-machine interaction will allow a greater number of physical 'things' to interact with other 'things' without human intervention for scalability.

The IoT MSc is designed to meet the demand for a new kind of IT specialist, who can:

- engineer new interactive products – 'things'
- acquire, fuse and process the data they collect from 'things'
- interact with, and interconnect, these 'things' as part of larger, more diverse, systems.

The School of Electronic Engineering and Computer Science draws on the strengths of its highly regarded research and development centres of excellence in core subject areas, comprising networks, cognitive science, and antennas, together with interdisciplinary centres such as the Centre for Intelligent Sensing (CIS) and the Centre for Digital Music (C4DM).

#### Programme outline

Core modules for all Internet of Things-related MSc programmes:

- Enabling Communication Technologies for IoT
- Introduction to IoT
- Mobile Services
- Research Project
- Security and Authentication
- MSc Project module

## Internet of Things MSc (Data Processing)

The interaction and communication between billions of devices produces and exchanges data related to real-world smart objects. This MSc develops your skills in data mining and big data analysis to better understand, utilise and leverage this data.

### Programme outline

Additional programme-specific core modules:

- Applied Statistics
- Data Analytics

Additional programme-specific option modules:

- Big Data Processing
- Cloud Computing
- Data Mining
- Digital Media and Social Networks
- Machine Learning
- The Semantic Web

## Internet of Things MSc (Engineering)

This MSc explores the human and machine interfaces and interaction between embedded systems, smart objects and humans.

### Programme outline

Additional programme-specific option modules:

- 21st Century Networks
- Cloud Computing
- Embedded Systems
- Interactive System Design
- Mobile and WLAN Technologies
- Network Modelling and Performance
- Real-Time and Critical Systems

## Internet of Things MSc (Intelligent Sensing)

This MSc is focused on developing devices, systems and services that can communicate and analyse, process and interpret data from multi-modal sources and devices.

### Programme outline

Additional programme-specific core modules:

- Fundamentals of DSP
- Graphical User Interfaces

Additional programme-specific option modules:

- Cloud Computing
- Design for Human Interaction
- Introduction to Computer Vision
- Machine Learning
- Real-time Digital Signal Processing
- Techniques for Computer Vision

### Who is this programme suitable for?

These programmes are suitable for students who have previously studied electronic engineering, computer science, maths, physics or a related discipline.

# Our masters programmes

## Networks and internet of things

### Network Science MSc

**One year full-time, two years part-time**

qmul.ac.uk/msc-net-sci

**Key themes:** communications theory, probability, stochastic processes, network analysis and modelling, network optimisation

This specialist masters programme is run jointly with the School of Mathematical Sciences, providing a thorough grounding in analytical and numerical methodologies as well as mathematical modelling as applied to networks, opening up a host of career opportunities in network and modelling-related industries. It is aimed at students with an undergraduate degree in mathematics or a related discipline, such as physics, computer science or engineering, who wish to enter a career involving the analysis and optimisation of diverse networked systems.

#### Overview

Network theory is a very active and rapidly evolving research field that stands at the crossroads of graph theory, complex systems and data analysis. It addresses the mathematical and numerical description, modelling of the architecture, and the dynamics of the complex systems composed by the many interacting units that show collective behaviour. Its impact and applications outside academia pervade technological sectors such as communications (internet, transportation networks), biostatistics and network biology (brain modelling, postgenomic era), infrastructures (energy networks, road networks, urban mobility) and public health (epidemic spreading models), to mention but a few.

Your dissertation project will be led by a member of the Complex Systems and Networks research group based in the School of Mathematical Sciences. There are research opportunities available in different areas including epidemiology and public health, complex networks and multiplexes, infrastructure, transportation and energy networks, time series analysis and networks, and systems biology.

### Programme outline

Core modules

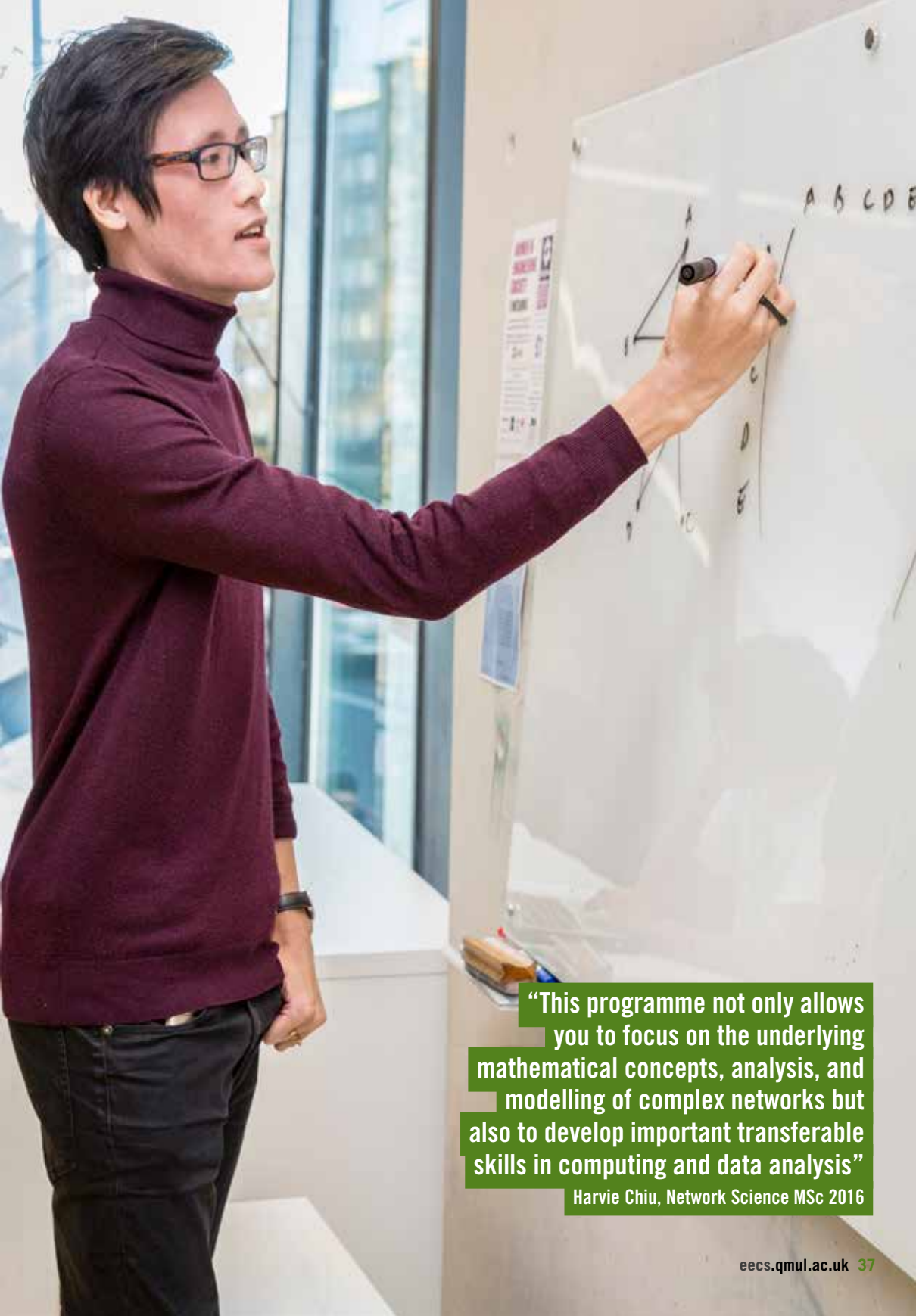
- Graphs and Networks
- MSc Dissertation
- Processes on Networks
- Research Methods in Mathematical Sciences
- Topics in Scientific Computing

Option modules

- Computational Statistics
- Complex Systems
- Digital Media and Social Networks
- Machine Learning
- Data Mining
- Database Systems
- Financial Programming

### Who is this programme suitable for?

This programme is suitable for students who have previously studied a subject with a substantial mathematical component: for example, mathematics, statistics, physics, computer science, engineering, or economics.



"This programme not only allows you to focus on the underlying mathematical concepts, analysis, and modelling of complex networks but also to develop important transferable skills in computing and data analysis"

Harvie Chiu, Network Science MSc 2016

# Our masters programmes

## Networks and internet of things

### Telecommunication and Wireless Systems MSc

**One year full-time, two years part-time, two years full-time with industrial experience**

qmul.ac.uk/msc-telco-wireless-sys

**Key themes:** mobile, 5G, network planning, network design and performance, simulation

This programme is designed to educate a generation of network engineers in the fundamental science, mathematics and technologies that have made global networking possible and will develop it further in the future. If you want to pursue a career shaping and defining a new generation of converged networks, responding to rapid developments (such as social networking, seamless mobility, mobile data and the proliferation of applications for mobile and handheld devices), then this MSc programme is for you.

#### Overview

This MSc programme teaches Java programming for network and service design, provides an in-depth treatment of the technological foundations of converged all-packet networks, and covers current mobile networks from WCDMA 3G to LTE and LTE-Advanced. It will enable you to develop an extensive understanding of 21st-century networks, current mobile and WLAN technologies, software for network and services design, network modelling, the new realm of sensors and the Internet of Things. Your tutors will be international experts in the fields of converged all-IP networks, modelling, measurements and quality of experience, and wireless technologies.

#### Programme outline

Core modules

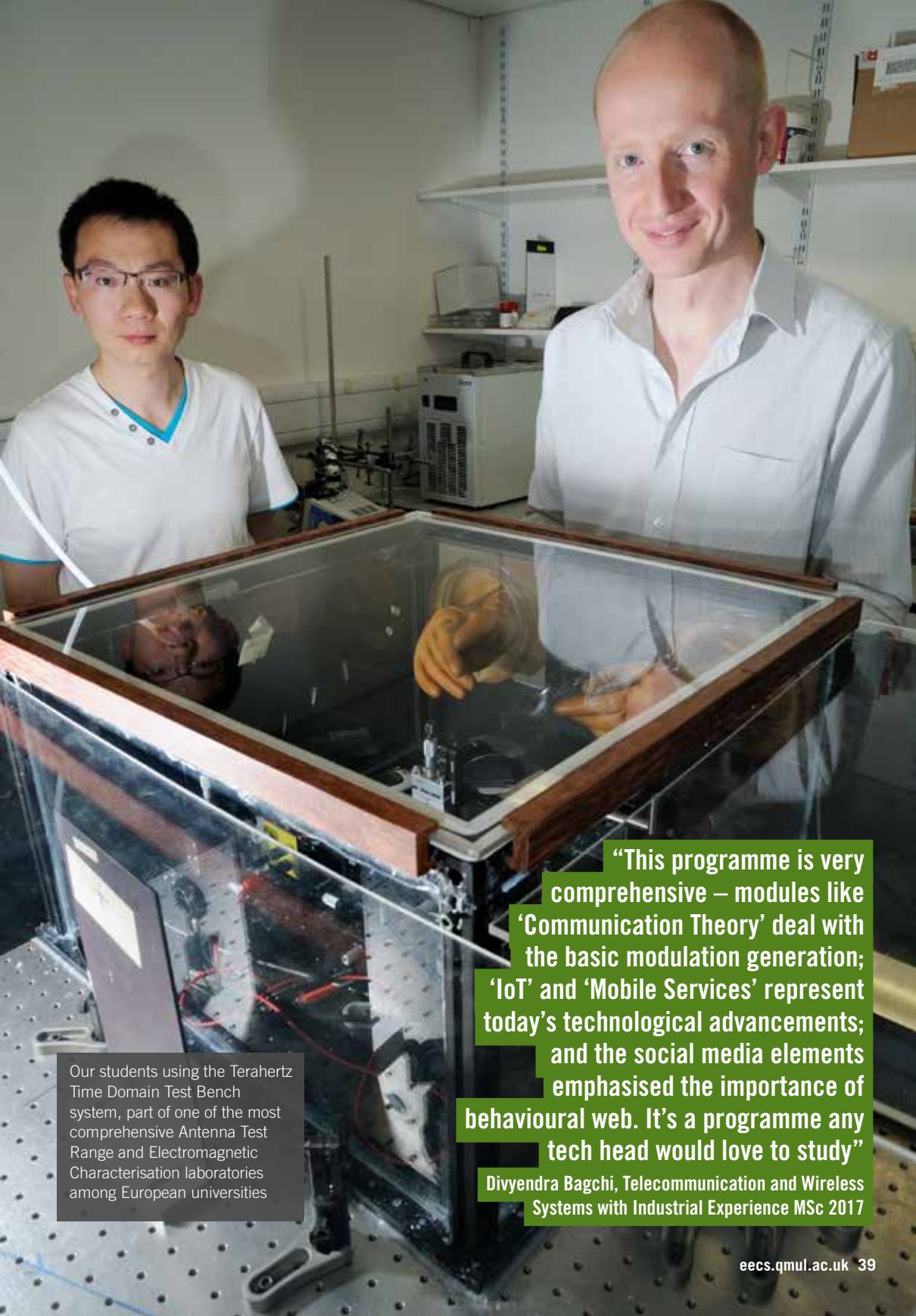
- 21st Century Networks
- Communication Theory
- Mobile and WLAN Technologies
- Mobile Services
- MSc Project module
- Network Modelling and Performance
- Software and Network Service Design

Option modules include

- Business Technology Strategy
- Digital Media and Social Networks
- Network Planning, Finance and Management
- Security and Authentication

#### Who is this programme suitable for?

This programme is suitable for students who have previously studied electronic engineering, computer science, maths or related topics, or who have significant relevant work experience.



Our students using the Terahertz Time Domain Test Bench system, part of one of the most comprehensive Antenna Test Range and Electromagnetic Characterisation laboratories among European universities

**"This programme is very comprehensive – modules like 'Communication Theory' deal with the basic modulation generation; 'IoT' and 'Mobile Services' represent today's technological advancements; and the social media elements emphasised the importance of behavioural web. It's a programme any tech head would love to study"**

**Divyendra Bagchi, Telecommunication and Wireless Systems with Industrial Experience MSc 2017**

# Our masters programmes

## Networks and internet of things

### Telecommunication and Wireless Systems Management MSc

**One year full-time, two years part-time, two years full-time with industrial experience**

qmul.ac.uk/msc-telco-wireless-sys-man

**Key themes:** mobile, network planning, network management and finance, network security, authentication

This programme provides training in the principles of converged networking, network planning, network management and network performance through an integrated curriculum designed to respond to rapid developments and growing demand in the discipline.

#### Overview

The programme will provide a greater appreciation of the business context in which networked applications and underlying information and communications technologies are used by organisations. Increased exposure to, and understanding of, the benefits of technology, business, and strategic knowledge and thinking will prepare you thoroughly for management roles within such organisations.

This programme prepares you for a career in telecommunications and its applications; for example, in the integration of voice and data applications within a business context. The programme combines in-depth coverage of the main technical aspects of telecommunications with advanced business modules.

At the end of the programme, you will be equipped with the skills needed for a wide range of jobs in the expanding telecommunications industry, with an emphasis on those that are relevant to business/financial needs, particularly in the small business and start-up sector.

### Programme outline

Core modules

- 21st Century Networks
- Business Technology Strategy
- Communication Theory
- Mobile and WLAN Technologies
- MSc Project module
- Network Planning, Finance and Management
- Software and Network Services Design

Option modules include:

- Digital Media and Social Networks
- Mobile Services
- Network Modelling and Performance
- Security and Authentication

### Who is this programme suitable for?

This programme is suitable for students who have previously studied electronic engineering, computer science, maths or related topics, or who have significant relevant work experience.

Wearable mobile wireless devices being tested in the Mobile Antenna EMC Screened Anechoic Chamber

**"My masters study introduced the right balance of key concepts and provided an insight into business aspects required in the field. It helped me earn an EECS scholarship to pursue a PhD in the Internet of Things and its application in mental health sector"**

**Mathangi Sridharan, Telecommunications Systems Management MSc 2015, currently undertaking a PhD in Electronic Engineering**

# Our masters programmes

## Cognitive and creative computing

### Cognitive Science MSc (four pathways: Cognitive Science, Cognitive Science of Language, Computational Methods in Cognitive Science, and Music Cognition)

**One year full-time, two years full-time with industrial experience**

qmul.ac.uk/msc-cognitive-sci

**(subject to approval)**

**Key themes:** artificial intelligence, psychology, neuroscience, music cognition, linguistics, biology, computational creativity

How do we make computers understand and act like the human mind? Can a computer be creative? Understanding the mind is one of the greatest challenges in scientific research, linking academic disciplines such as psychology, neuroscience, philosophy, linguistics, and artificial intelligence.

#### Overview

This multidisciplinary programme explores a variety of different fields of study within the unified framework of cognitive science. You will have the option to work with our internationally renowned researchers in Computer Science, Centre for Digital Music (C4DM), Psychology, Linguistics, and the Centre for Mind in Society. The programme is organised around five core modules, three option modules, and a final dissertation-based research project. We offer a set of related degrees on the theme of cognitive science, with specialisations into computational cognitive science, language cognition, and music cognition.

### Programme outline

Core modules for all Cognitive Science-related MSc programmes

- Advanced Research Methods 1
- Advanced Research Methods 2
- Artificial Intelligence
- Cognitive Modelling
- Cognitive Psychology
- MSc Project module in Cognitive Science

Option modules available for all Cognitive Science-related MSc programmes

- Animal Cognition
- Design for Human Interaction
- Neuroscience: From Molecules to Behaviour
- Resilience: A Concept of Psychological Resistance

### Cognitive Science MSc

**One year full-time, two years full-time with industrial experience**

**(subject to approval)**

This programme offers an integrated approach to the study of human behaviour in domains such as language, decision-making, reasoning and the construction of cultural structures and social structures.

### Programme outline

Programme-specific option modules include:

- Animal Cognition
- Design for Human Interaction
- Neuroscience: From Molecules to Behaviour
- Resilience: A Concept of Psychological Resistance

## Cognitive Science of Language MSc

### One year full-time, two years full-time with industrial experience

**(subject to approval)**

This programme of study delves into the structure and evolution of language, in relation to understanding the interface between language and cognition and the development of adaptive computational models.

## Programme outline

Additional programme-specific option modules include:

- Concepts and Consequences in Grammatical Theory
- Experimental Linguistics
- Extensional Semantics
- From Morpheme to Meaning
- Intensional Semantics
- Natural Language Processing

## Computational Methods in Cognitive Science MSc

### One year full-time, two years full-time with industrial experience

**(subject to approval)**

This innovative MSc provides you with the skills to analyse and model human behaviour using computational and formal approaches, developing and exploring mental representations with psychological approaches to understanding behaviour, within a rigorous scientific framework.

## Programme outline

Additional programme-specific option modules include:

- Consciousness and Causality
- Digital Media and Social Networks
- Functional Programming
- Interactive System Design
- Introduction to Computer Vision
- Java Programming
- Machine Learning
- Natural Language Processing
- Software and Network Services Design

## Music Cognition MSc

### One year full-time, two years full-time with industrial experience

**(subject to approval)**

This programme draws on the research performed by the Centre for Digital Music (C4DM) and investigates the connections between music and areas of cognitive science, including perception, processing, learning and development.

## Programme outline

Additional programme specific option modules include:

- Music Cognition
- Music and Speech Processing

## Who is this programme suitable for?

These programmes are suitable for students who have previously studied computer science, Linguistics and Psychology or related topics, or who have significant relevant work experience.

# Our masters programmes

## Cognitive and creative computing

### Media and Arts Technology by Research MSc

**One year full-time**

qmul.ac.uk/msc-matr

**Key themes:** hacking objects, digital media, human interaction, wearables, new instruments, contemporary studio production techniques, interactive digital media, industrial placement

The Media and Arts Technology (MAT) by Research MSc at QMUL is an innovative degree that is unique in the UK. MAT provides a bridge between academic research, digital technologies, and creative industries. It offers innovative interdisciplinary programmes in the sciences and technologies that transform the creative sector, with a special focus on sound, music, media, and interaction.

You will work under the supervision of internationally recognised experts in digital music, digital video, and interaction design and human computer interaction. You will also have the chance to develop a working partnership with one of our strategic collaborators, who have included: BBC, last.fm, Sony Computer Entertainment Europe, BT, Inition, Cinimod Studio, Proctor and Gamble, and M&C Saatchi.

#### Overview

The MAT MSc by Research in combines coursework across disciplines with a five-month advanced placement project with an industry partner. This innovative programme, unique in the UK, comprises four main components:

- a series of specially tailored taught modules
- a placement project with an external partner leading to a thesis.
- Media and Arts Technology (MAT) MSc students have access to the MAT workshop, recording facilities and a dedicated MAT lab.

#### Programme outline

The core modules on this programme are assessed through coursework alone. Option modules are examined through a combination of coursework and written examinations and the advanced placement project is examined by thesis and viva, plus a public presentation.

Core modules

- Digital Arts Documentary
- Interactive Digital Multimedia Techniques
- MSc Advanced Placement Project
- Sound Recording and Production Techniques

#### Who is this programme suitable for?

This programme is suitable for students who have previously studied electronic engineering, computer science, maths, design-oriented or related topics including a background in the visual arts, design, architecture, new media, user experience, human-computer interaction; or a background in social science, eg psychology, sociology, or a similar discipline;, or who have significant relevant work experience.

"QMUL is the best university in the UK for interactive media. The lecturers, installations and workshops are amazing, and you are encouraged to be creative with free rein to do whatever you want, even the craziest ideas!"

Daniel Gabana Arellano, Media and Arts Technology by Research MSc 2014, now undertaking a PhD

# Our masters programmes

## Cognitive and creative computing

### Sound and Music Computing MSc

**One year full-time, two years part-time, two years full-time with industrial experience**

qmul.ac.uk/msc-snd-msc-comp

**Key themes:** music cognition, recording and mixing, music production, audio processing, digital effects, machine listening, interactive sound and music systems, music information retrieval, new instrument design, musical expression

Developed by the acclaimed Centre for Digital Music (C4DM), this programme responds to a growing skills shortage in industry for engineers and computer scientists trained specifically in sound and music processing, as digital media becomes ever more advanced and ubiquitous.

#### Overview

You will develop core knowledge of advanced music and audio technologies, giving you the background and skills you will need for a career in the technical aspects of audio production or engineering, broadcasting, intelligent signal processing, computational music analysis, music information retrieval or another area of sound and music computing.

You will graduate with the potential to become a pioneer in developing future generations of music technologies. Your taught modules will be fully supported by computing and laboratory work. The MSc is intended for graduates in a related discipline, who wish to hone and enhance their skills, and for industrialists with experience of sound and music computing who seek formal qualifications.

#### Programme outline

Core modules

- Fundamentals of DSP
- Music Perception and Cognition
- MSc Project module

Plus one of:

- Interactive Digital Multimedia Techniques
- Sound Recording and Production Techniques

At least two from:

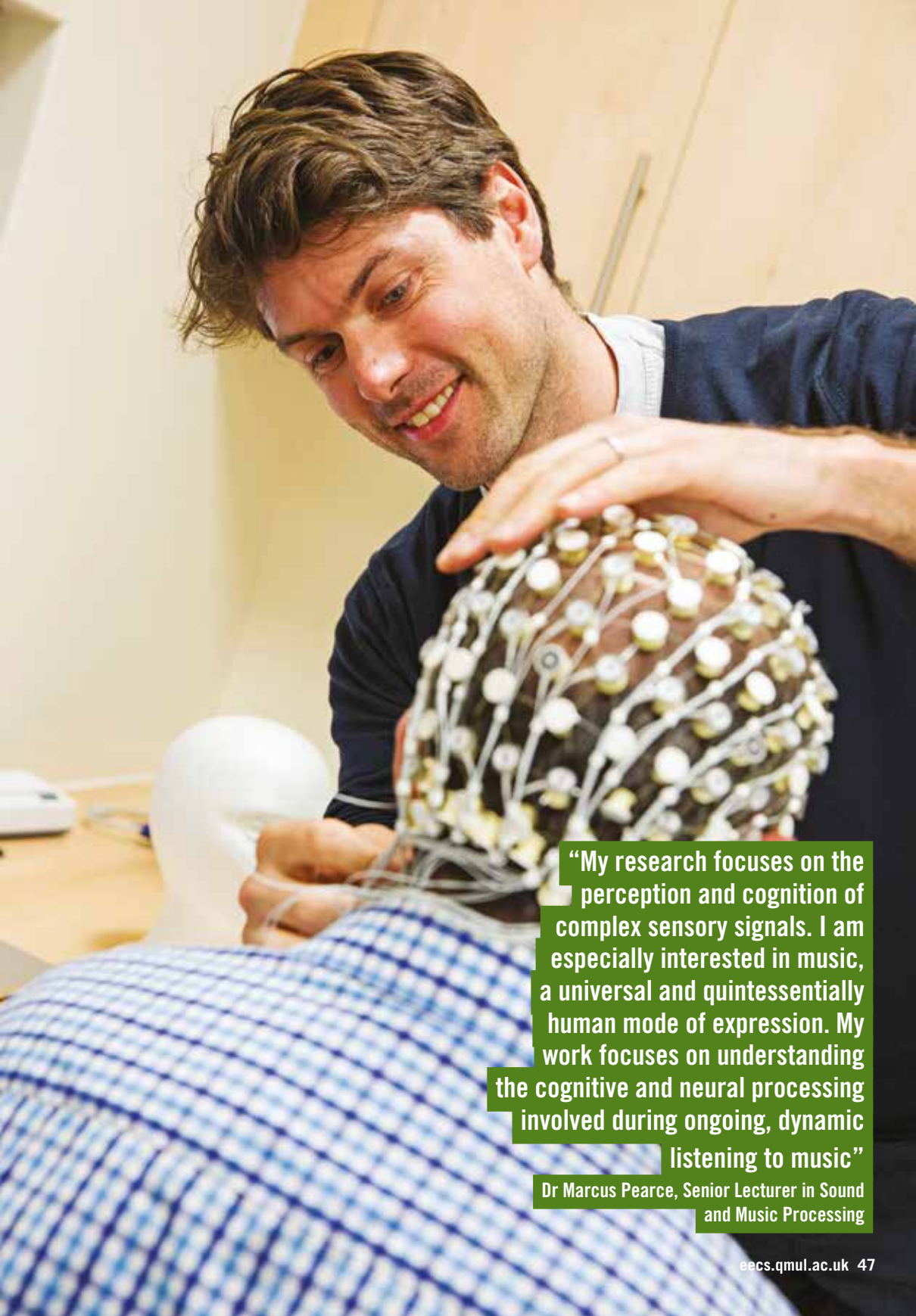
- Digital Audio Effects
- Music Analysis and Synthesis
- Music and Speech Processing
- Real-Time DSP

Option modules include:

- Big Data Processing
- Interactive System Design
- Machine Learning
- The Semantic Web

#### Who is this programme suitable for?

This programme is suitable for students who have previously studied electronic engineering, computer science, maths or related topics, or who have significant relevant work experience.



"My research focuses on the perception and cognition of complex sensory signals. I am especially interested in music, a universal and quintessentially human mode of expression. My work focuses on understanding the cognitive and neural processing involved during ongoing, dynamic listening to music"

Dr Marcus Pearce, Senior Lecturer in Sound and Music Processing

# Our research

## Our research-led approach

We are well known for our pioneering research and pride ourselves on our world-class projects. Our main research groups are:

### Antennas and Electromagnetics

The group has comprehensive experimental facilities in the Antenna Measurement Laboratory. Their areas of research include the possible advances in antennas offered by new nano-materials, such as graphene and carbon nanotubes; helping scientists to visualise structures with Terahertz Spectroscopy; the interaction of electromagnetic waves with biological tissue; and radio propagation for body-centric wireless communications.

### Centre for Digital Music (C4DM)

Leading the UK in digital music research, this multi-disciplinary group works in the field of music and audio technology – from record/replay equipment in the home or studio, to the simulation and synthesis of instruments and voices, acoustic spaces, music understanding, delivery and retrieval. They have a state-of-the-art listening room and performance lab, and regularly release algorithms under open-source licenses while maintaining a healthy portfolio of patents.

### Cognitive Science

Combining ideas from the arts, engineering and science, this group examines how technology changes what it is possible for people to do. They have built up world-class research facilities, including the Augmented Human Interaction (AHI) Laboratory, which combines motion-capture equipment with novel 3D auditory and visual displays. Their current projects include safer medical devices, socially aware robots, and technology in clinical interactions in mental health.

### Theoretical Computer Science

This group specialises in the foundations of computer science using logic, maths and statistics. They discover the power and limitations of computer systems and collaborate with Amazon, Facebook, IBM and others on techniques for finding bugs and security flaws. In 2013, Monoidics – a successful spin-out company born out of this research – was bought by Facebook.

### Computer Vision

Our surveillance society is big news, but what technology lies behind this and how can a computer interpret the myriad CCTV images we capture? This group's work has been applied to vehicle and people detection, object tracking, counting and recognition in public space CCTV, human gesture recognition and abnormal behaviour recognition in visual surveillance. The group's research attracts significant interest from industry and the government, with a current significant focus on crime prevention.


Professor Johnathan Pitts (first on the right) celebrating the listing of Actual Experience public shares on to the Aim Market at the London Stock Exchange Market Opening Ceremony

## Research in focus

**Project profile – Actual Experience**

Actual Experience was founded in 2009, to commercialise 10 years of research originally undertaken at QMUL, by our Chief Science Officer, Professor Jonathan Pitts.

The company enables business leaders to analyse everything that impacts the experience quality in digital supply chains, whether inside or outside the business's control, from the point of provision to the point of use. These insights are used to make continuous improvements to the digital business. High profile customers include broadcasting regulator Ofcom, Verizon and Vodafone.

Actual Experience plc has been listed on the AIM market at the London Stock Exchange since February 2014 and is currently valued at more than £100m.

Actual Experience's development headquarters are in Bath, UK, and we have offices in London, New York and Seattle.

Find out more at: **actual-experience.com**

# Our research

**Multimedia and Vision**
Combining blue-sky research with market-ready applications, the objective of the Multimedia and Vision group is to develop media processing technologies that improve people's lives and society. Group members are working on imaging technologies for cancer detection; scalable source and channel video coding for enhanced broadcasting and internet applications; video analysis for security and forensics; and new approaches for multi-view, multi-sensor 3D modelling in virtual and augmented reality scenarios. The group was founded in 2000 and is firmly embedded in relevant international research networks.

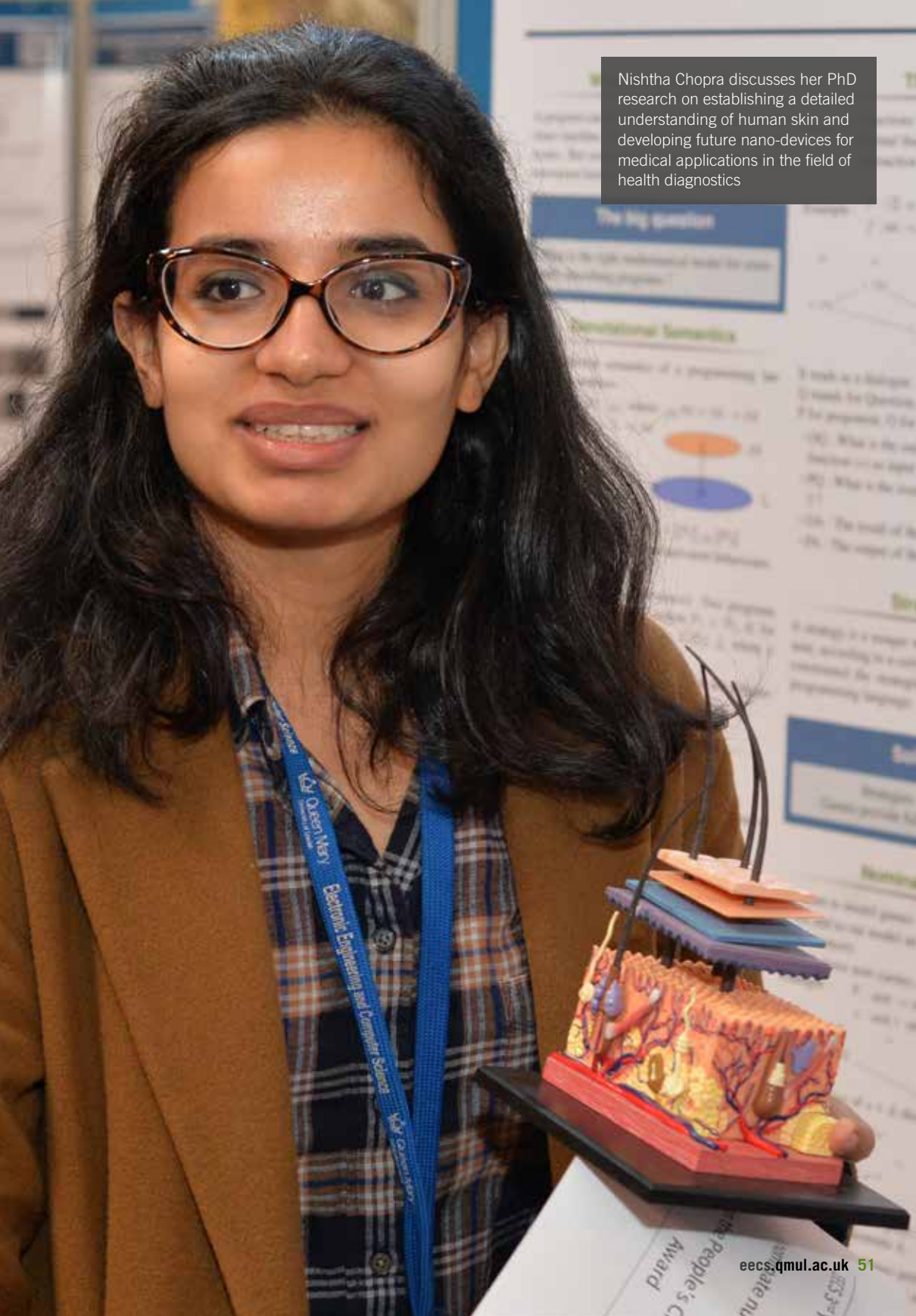
**Networks**
With an international reputation for bringing intelligence and performance assessment techniques to fixed and mobile communication networks, this group has been supported by a succession of funded projects. Their wireless research covers areas including cognitive radio, cooperative networks, energy efficiency and network security. They are also active in many key areas of the current and future internet such as cloud, content delivery, and evaluation of user perceived network quality and online social networks.

**Risk and Information Management**
We have a deluge of data but can we find what we want and use it to make decisions? This group focuses on problems of uncertainty and decision-support using methods from statistics, machine learning and psychology. The power of advanced computing is combined with the insight of human expert judgement to address challenges of scale and complexity in a wide range of applications, including medical, legal, systems engineering, bioinformatics, security, risk and safety.

**Centre for Advanced Robotics**
The Centre for Advanced Robotics at Queen Mary (ARQ) is a multidisciplinary and cross faculty research group conducting research on all aspects of modern robotics and its biomedical, industrial and service applications. The centre is composed of leading experts in the field of robotics, as well as of researchers from computer science, materials science, design, bioengineering and medical sciences.

Research Highlights:

- 11th in the UK for quality of computer science research (REF 2014)
- 6th in the UK for quality of electronic engineering research (REF 2014)
- 300 research publications per year (average over last three years)
- 30 industrial partners collaborating with us on research in the last five years




Nishtha Chopra discusses her PhD research on establishing a detailed understanding of human skin and developing future nano-devices for medical applications in the field of health diagnostics

# Funding your masters

## Tuition fees

You can find a full list of both UK/EU and international tuition fees at: qmul.ac.uk/tuitionfees

## Funding

We want to attract the best students to QMUL, regardless of their financial situation. Every year we offer a range of scholarships for academically excellent students.

For the latest information, visit: qmul.ac.uk/postgraduate/taught/funding_masters

As a guide, in 2017 we were able to offer the following:

### Commonwealth Scholarships (international students only)

QMUL worked in partnership with the Commonwealth Scholarship Commission in the UK to offer a wide range of scholarships for postgraduate study at masters and PhD level. Scholars from developing and developed Commonwealth countries were eligible to apply for these awards.

### Chevening scholarships (international students only)

This is a worldwide scheme to fund masters-level study for international students, administered by the UK's Foreign and Commonwealth Office. QMUL attracted more than 80 Chevening Scholars in 2016/17.

Visit: chevening.org or your local British Council office: britishcouncil.org

### International Science and Engineering Excellence Awards (international students only)

This extensive scheme provided awards of up to £5,000 for students, based on their academic achievement. To achieve the highest award, students had to hold a UK first-class bachelors degree or equivalent.

### Machine Learning for Visual Data Analytics MSc Scholarship

The Machine Learning for Visual Data Analytics MSc offered two MSc fee waivers on a competitive basis. In addition to this, we awarded two PhD fee waivers for top-ranked students in this MSc who wanted to continue on to our PhD programme.

### QMUL Alumni Loyalty Awards

If you are a Queen Mary graduate, you may be eligible for our Alumni Loyalty Award for masters study (£1,000).

### Science and Engineering Taught Scholarships (Home/EU students only)

We award £1,500 to every Home/EU student accepted on to a science and engineering programme with a UK first-class bachelors degree or equivalent.

Canary Wharf as seen from our new Graduate Centre

## Postgraduate Loan (Home/EU students only)

The government Postgraduate Loan scheme offers up to £10,280 per programme for 2017 entrants. The Loan is available for any taught masters programme or Master of Research (MRes), including part-time study.

You must be aged under 60 on 1 August of the year in which you start your programme, and other eligibility criteria will also apply (see the government's website). If you already hold a masters degree or higher level qualification, you won't normally be eligible for this Loan.

For further information on how to apply, eligibility criteria, payment information, and loan repayments, including salary scales and interest rates, visit:

The UK government's website: **www.gov.uk/postgraduate-loan**

QMUL's Postgraduate Funding advice guide: **welfare.qmul.ac.uk/guides/postgraduate-funding**

QMUL's Funding a Masters webpages: **qmul.ac.uk/postgraduate/taught/funding_masters**

# Essential information

**School of Electronic Engineering and Computer Science**
Tel: +44 (0)20 7882 7333
Email: eecs-msc-enquiries@qmul.ac.uk

## Entry requirements

For specific entry requirements for your chosen programme, please visit our website. In general, however, most of our programmes require:

- An upper second-class degree, usually in electronic engineering, computer science, maths or a related discipline. Students with a good lower second-class degree may be considered on an individual basis.

The main exceptions to this are:

- Our more interdisciplinary courses, which allow for a wider range of backgrounds:

– Cognitive Science MSc, which is also suitable for applicants with backgrounds in psychology, linguistics or similar.

– Media and Arts Technology by Research MSc which requires an upper second-class degree degree (or higher) in a background in the visual arts, design, architecture, new media, user experience, human-computer interaction; or a background in social science e.g. psychology, sociology, or a similar discipline.

– Network Science and Financial Computing MSc, which requires an upper second-class degree degree (or higher) in a background with a substantial mathematical component.

- Our conversion courses, which are for graduates from outside computer science and electronic engineering:

– Computing and Information Systems MSc (conversion programme), for graduates of non-computer science disciplines

– Electronic and Electrical Engineering MSc (conversion programme). You may have previously studied, for example, maths, physics, biology, chemistry or computer science, or a degree with less than 50 per cent of the modules in electronic and electrical engineering subjects.

For some other programmes, unrelated degrees will also be considered if substantial relevant industrial experience is shown.

As we work in rapid moving and innovative subjects areas, the information presented in this prospectus is correct at the time of going to print.

**English Language requirements**
All applicants must show they meet a minimum English language standard. The English language levels vary between programmes, and you can read full details online at: qmul.ac.uk/eng-lang-reqs

If you have not achieved the required English language level yet, you may be eligible to take a Pre-sessional English course, or continue to take English language tests in your country to reach the level needed. Visit: sllf.qmul.ac.uk/language-centre/presessionals

Please check our website for the most up-to-date information about degree programmes and associated entry requirements.

## How to apply

You can apply for all our postgraduate programmes online. While there are no set deadlines for degree applications, we advise you to apply as early as possible to make sure your application is considered and to take advantage of any funding opportunities which may have early deadlines.

Visit: qmul.ac.uk/postgraduate/howtoapply

## Accommodation

We offer approximately 500 spaces specifically to our postgraduate students and the majority of these are at our Mile End campus. We can also provide advice on a range of alternative housing, such as renting, private halls or homestay.

Tel: +44 (0)20 7882 6474
Email: residences@qmul.ac.uk
residences.qmul.ac.uk

## International students

We offer a range of support services to students joining us from around the world, including in-country meetings, pre-departure briefings, an airport collection service, and the International Welcome Programme. We also offer advice about accommodation, scholarships, funding, summer school, study support, visas and English language requirements.

Tel: +44 (0)20 7882 6530
Email: internationaloffice@qmul.ac.uk
Visit: qmul.ac.uk/international

## Postgraduate open events for 2018

- 17 January 2018, Virtual Open Day
- 7 February 2018, Open Evening
- 9 May 2018, Virtual Open Day
- 18 July 2018, Virtual Open Day
- 5 September 2018, Open Afternoon

Visit: qmul.ac.uk/postgraduate/meet-us

## QMUL Doctoral College

Many of our masters students go on to undertake PhD research. If you would like to find out more about becoming a researcher, visit: doctoralcollege.qmul.ac.uk and qmul.ac.uk/postgraduate/research

# Your guide to London


# Key:

- **Silicon Roundabout**
- **Amazon**
  60 Holborn Viaduct, London EC1A 2FD
- **Facebook**
  10 Brock St, Kings Cross,
  London NW1 3FG
- **Google**
  1-13 St Giles High St,
  London WC2H 8AG
- **Institution of Engineering and Technology (IET)**
  2 Savoy Pl, London WC2R 0BL
- **BCS (Chartered Institute for IT)**
  5 Southampton St, London WC2E 7HA
- **Canary Wharf**

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## Terms and conditions

We have endeavoured to ensure that the information contained in this prospectus is both helpful and accurate at the time of going to press. There are circumstances in which we may still make changes to the programmes and services that we provide. For this reason, it is important that you check our website (qmul.ac.uk) for the most up-to-date information, or contact us, using the details contained within this document, before you apply.

We regularly update our programmes so that students can learn from the latest academic research and to make improvements in dialogue with current students and employers. Other circumstances that can lead to changes include:

- changes of academic staff, which can lead to new modules being offered and existing modules being withdrawn
- new requirements from professional or statutory bodies or
- changes to the way in which universities and services are funded.

If you apply to us and we offer you a place to study at QMUL, we will endeavour to deliver your chosen programme as is advertised when we make our offer of admission. For this reason, it is important that you check our website for the most up-to-date information, or contact us using the details contained within this document, before you accept an offer. We will only suspend or withdraw your chosen programme in exceptional circumstances, such as if a key member of academic staff or essential teaching facilities become unavailable without warning. Programmes may also be suspended where the demand from applicants makes them unviable. If we have to suspend or withdraw your chosen programme after you accept an offer, we will inform you at the earliest opportunity and make every effort to provide a suitable alternative.

For up-to-date descriptions of our programmes, visit: qmul.ac.uk/postgraduate/coursefinder

## Contact

Queen Mary University of London, Mile End Road, London E1 4NS qmul.ac.uk

We would like to thank the staff and students who took part in these photographs. Student and departmental photography by Jorge Estevao (jdestevao.com) and Jonathan Cole (JonathanColePhotography.com) and Layton Thompson (LaytonThompson.com)

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Queen Mary
University of London

**For further information contact:**
School of Electronic Engineering and Computer Science
Queen Mary University of London
Mile End Road,
London E1 4NS
Tel: +44 (0)20 7882 7333
Email: eecs-msc-enquiries@qmul.ac.uk
**eecs.qmul.ac.uk**

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## Contact us

For general admissions enquiries about the admissions process for taught masters programmes:

Tel: +44 (0)20 7882 5533
Email: pgtadmissions@qmul.ac.uk

For general admissions enquiries about the admissions process for research degree programmes:

Tel: +44 (0)20 7882 2207/5860
Email: researchadmissions@qmul.ac.uk

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