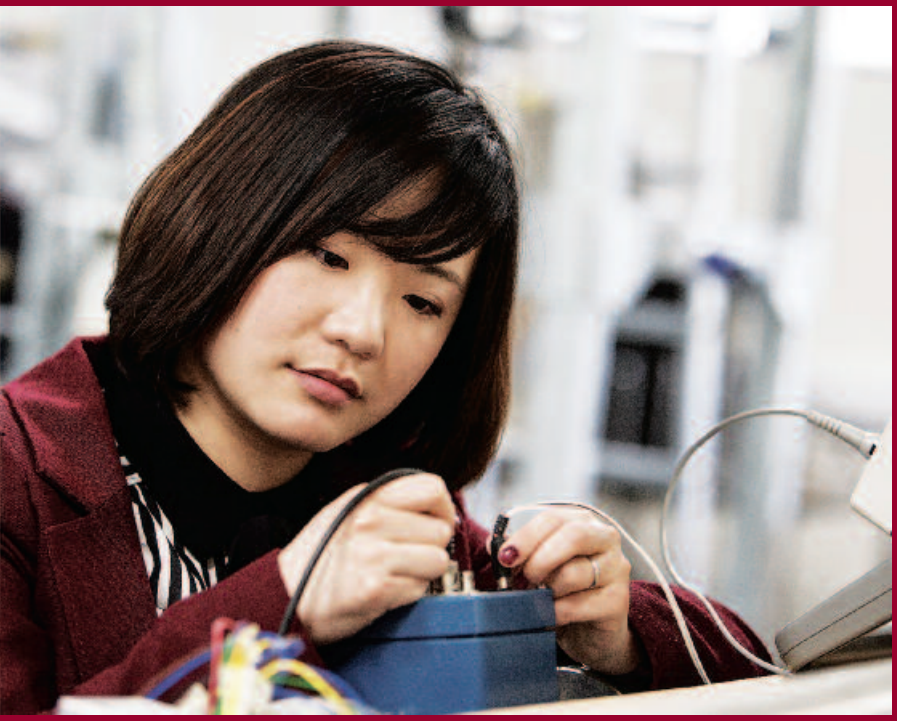
The UK's European university

University of Kent



SCHOOL OF ENGINEERING AND DIGITAL ARTS

Canterbury

Graduate study

50
1965-2015
THE UK'S EUROPEAN UNIVERSITY

INTRODUCTION

The School of Engineering and Digital Arts successfully combines modern engineering and technology with the exciting new field of digital media. The School was established over 40 years ago and has developed a top-quality teaching and research base, receiving excellent ratings in both research and teaching assessments.

World-leading research

The School undertakes high-quality research that has had significant national and international impact, and our spread of expertise allows us to respond rapidly to new developments. Our 32 academic staff and over 130 postgraduate students and research staff form teams providing an ideal focus to effectively support a high level of research activity. There is a thriving student population studying for postgraduate degrees in a notably friendly and supportive teaching and research environment.

Research funding

We have research funding from the UK Research Councils, European research programmes, a number of industrial and commercial companies and government agencies – such as the Ministry of Defence, among many others.

Research groups

Research in the School is supported by our four research groups:

- Broadband and Wireless Communications
- Instrumentation, Control and Embedded Systems
- Image and Information Engineering
- Digital Media.

For details of current research, see p21.

Postgraduate resources

The School is well equipped with a wide range of laboratory and computing facilities and software packages for teaching and research support. There is a variety of hardware and software for image acquisition and processing, as well as extensive multimedia computing resources. The School has facilities for designing embedded systems using programmable logic and ASIC technology, supported by CAD tools and development software from international companies, including Cadence™, Xilinx™, Synopsys™, Altera™, National Instruments® and Mentor Graphics™. The SMT laboratory can be used for prototyping and small-volume PCB manufacture. A well-equipped instrumentation research laboratory is also available.

Students studying communications have access to both commercial and in-house software tools for designing microwave, RF, optoelectronics and antenna systems (such as ADS™, CST™, HFSS™) and subsequent testing with network and spectrum analysers up to 110 GHz, an on-wafer prober and high-quality anechoic chambers.

Students on the Computer Animation and Digital Visual Effects programmes work in a dedicated, state-of-the-art suite, equipped with leading-edge PC workstations running Alias™ Maya and Foundry Nuke. There is also a photographic studio and a production studio with green screen and motion capture facilities. In addition, the School is equipped with a 3D body scanner – one of only two in the UK.

Students on the Information Security and Biometrics Master's course have access to state-of-the-art biometrics equipment, which can be used for studying the characteristics of the different biometric modalities introduced during the course.

Expert teaching

Our teaching is informed by our research, which means that you are learning at the forefront of your field. Our academics have a wide range of experience, both in industry and academia, which allows students to benefit from their real-world experience.

Industry collaboration

We ensure that all of our programmes meet the current needs of industry and we have worked with the world-leading visual effects company Framestore to develop our Computer Animation programme. Our excellent reputation has allowed us to build up a wide range of contacts.

Our Electronic Systems Design Centre and Digital Media Hub provide training and consultancy for a wide range of companies. Many of our research projects are collaborative, and we have well-developed links with institutions worldwide.

Supportive environment

As a postgraduate student, you are part of a thriving research community and receive support through a wide-ranging programme of individual supervision, specialised research seminars, general skills training programmes, and general departmental colloquia, usually with external speakers. We encourage you to attend and present your work at major conferences, as well as taking part in our internal conference and seminar programmes.

Dynamic publishing culture

Staff publish regularly and widely in journals, conference proceedings and books. Among others, they have recently contributed to: *IEEE Transactions*; *IET Journals*; *Electronics Letters*; *Journal of Applied Physics*; *Computers in Human Behaviour*. For details of staff research interests, see p23.

STUDENT PROFILES

Georges Haddad is studying for a Master's in Broadband and Mobile Communications Networks.

What attracted you to Kent?

I chose Kent because it was the best fit for me. I am very interested in 3G and 4G networks and the MSc in Broadband and Mobile Communications covers this area.

I also wanted to combine my studies with a good social life and was attracted to Kent as it is 'the garden of England' – postgraduate study is quite intense so I thought living in such a beautiful place, with lots of friendly people would give me a chance to relax. Also, Canterbury is just an hour from London.

How is the course going?

I am very happy. We have learnt about the history of mobile networks, current networks and what is likely to happen in the future. The course is well-designed; in your first two terms the modules you study give you the knowledge you need to decide on the subject of your research project, and the basis for building a successful career in telecommunications.

Tell us about your project.

I have chosen the project Space-Time Coding and Decoding in LTE. I submitted a project proposal, a poster and a literature review and fortunately received good marks. I have begun my project and have regular meetings with my supervisor,

where he makes sure I am on the right track and, if I need help, points me in the right direction. My supervisor has told me that I am the first student to do a project on this particular integrated circuit (FPGA), so if I am successful it will be a great thing for me and the School as well; it will be difficult but it is also exciting to try and succeed in building something challenging. For my practical work, I have access to the Antenna Laboratory, a state-of-the-art lab containing the FPGA circuit, powerful computers and an anechoic chamber where I can conduct experiments and simulations on the circuit.

Are the lecturers supportive?

Yes. One of the reasons I chose Kent was the detailed responses the professors gave to questions I sent them about the course. Once here, that level of engagement has continued. On a personal level, I am from Syria and the current situation has led to some practical difficulties for me, but my supervisor has been very helpful and made sure that I can concentrate on my studies.

What about the other students?

We are a close group; during revision time we worked together and that was great. When the exams were over, we went out for a meal to celebrate and now that we are all working on our projects it is good to have that supportive network.

What do you think of the facilities?

In addition to the excellent laboratory facilities, the library is also well stocked for our subject. The School has a subscription to IEEE, an online database for engineers, where all the latest journal articles are placed. Access to this is essential for all of the students as we need the most up-to-date information for our projects, but without the School subscription it would be very expensive for us.

What are your future plans?

I would like to continue my studies by doing a PhD. However, I need to decide whether it would be better to get some practical work experience first. Ultimately, I will return to Syria and, when peace prevails, hopefully be a part of establishing fourth generation communication networks there.

Any advice for future students?

If you choose Kent, you will have made a very good decision! For postgraduate study, it is important to look at the course first and make sure it is exactly what you want. My programme lasts one year but I am enjoying the experience so much, I wish it was two!

Meryem Erbilek recently completed her PhD in Electronic Engineering.

Why did you choose to study at Kent?

There are two reasons: first, Kent is in the top ten universities in the UK in the field of electronic engineering; and second, the Image and Information Engineering research group at Kent is one of the best in the UK for research in biometric systems and security, which is the area I am most interested in.

What are you researching?

My research covers the following areas: iris segmentation and recognition; signature feature analysis and recognition; ageing effects in biometric systems – especially in iris and signature modalities; predicting soft-biometric information such as age and gender from biometrics – especially from iris images and signature samples; and analysis of differences between handwritten signatures and digital tablets. I really enjoy being part of a research group and doing the research itself.

How have you found the supervision process?

The supervision process has helped me to improve my personal and research skills. I have learnt that undertaking a PhD is not only about studying and improving science but also about improving my personal development through the power of science as well.

How have you funded your studies?

The School of Engineering and Digital Arts (EDA) and the University gave me a full scholarship for three years to complete my PhD studies. Also, the School paid for me to attend an international conference and present my paper.

How does postgraduate study differ from undergraduate study?

I think that through your undergraduate studies, you learn about your subject from experts in the field who tell you what to study and how to do it. Through your postgraduate studies, you work independently to improve your knowledge of your subject and, through your research, you expand the knowledge base in your subject area.

How do you think your studies at Kent will affect your employment prospects?

Through my studies, I have gained both personal and research skills. I have published several papers in international journals and at conferences. I am now employed as a research associate and work on several projects. I believe this experience has helped me to gain additional skills to those usually acquired by PhD students and think these skills will make me more employable in the future.

What does doing a further degree give you that a first degree doesn't?

I think studying for a postgraduate degree gives you the opportunity and the freedom to discover, learn and use your skills to improve science.

What are you planning to do next?

I have completed my PhD and am working as a research associate at EDA at the moment. However, I plan to work as an academician and establish myself as an important researcher in the field of biometrics, and to make powerful and useful contributions to science and, of course, to the world.

What advice would you give to anyone thinking about taking a research degree at Kent?

I would say: you should know that doing a PhD is not a course of study – as your undergraduate degree was – more it's a kind of dream, aim, passion, and one of the biggest life adventures you will ever have!

IMPRESSIVE CAREER PROSPECTS

A postgraduate qualification from Kent opens up a wealth of career opportunities by providing an impressive portfolio of skills and specialist knowledge.

Employers recognise that a postgraduate qualification demonstrates a wide range of skills. During your programme, you acquire a high level of academic knowledge and specialist practical skills.

In addition, we provide a comprehensive package of skills development training programmes, careers advice, and volunteering and paid work opportunities to help enhance your career prospects.

Transferable skills training

Today, employers are looking for transferable skills such as communication, time management, analytical skills, business awareness, teamworking and problem solving. Dealing with challenging ideas, thinking critically, the ability to write well and present your ideas are all skills you learn at Kent. This makes it possible to be successful within a wide range of careers, not just those directly related to your studies.

The University's Graduate School co-ordinates the Researcher Development Programme for research students, providing access to a wide range of lectures and workshops on training, personal development planning and career development skills. The Graduate School also delivers the Global Skills Award programme for students following taught programmes of study, which is specifically designed to consolidate your awareness of current global issues and improve your employment prospects.

Exciting career options

Graduates from our postgraduate programmes have excellent employment prospects. Over 90% of Kent's postgraduate students who graduated in 2012 found a job or further study opportunity within six months.

Career prospects for EDA graduates are wide ranging. Recent graduates have gone on to work in areas including: web development and design; software, hardware or electronic engineering; broadcast journalism; teaching and lecturing; product development; ecommerce; and banking. They have become airline pilots, management consultants, patent examiners, stockbrokers and research scientists, and work for companies including the BBC, British Airways, Mitsubishi, Lloyds Banking Group, Samsung and Madame Tussauds. Others have set up their own companies or consultancies. See opposite for case studies.

Careers and Employability Service

Our Careers and Employability Service can help you to plan for your future by providing one-to-one advice at any stage in your postgraduate studies. It also offers online advice on employability skills, career choices and applications, and interview skills.

Further information

For more information on the careers help we provide at Kent, visit our Employability webpage at www.kent.ac.uk/employability

GRADUATE SUCCESS

Image courtesy of Sony/MGM/Eon

Graduates from across our programmes have gone on to use the skills learnt at the School to great effect.

Our Computer Animation and Digital Visual Effects Master's programmes are designed with a strong focus on current professional practice, which has helped our graduates secure jobs at some of the best film production companies in the UK.

Recent successes have included three graduates of our Digital Visual Effects Master's programme, Robin Walsh, Amz Rattan and James Rustad, who worked on the highly acclaimed James Bond movie, *Skyfall*. They were involved in one of the longest ever opening sequences in an action movie, working on special effects, including modelling, animation, texturing, motion capture, lighting, rendering and compositing, all of which they gained experience of on their programme.

Walsh and Rattan, who are both employed by Double Negative, a leading film and visual effects company, also worked on the film adaptation of *Les Miserables*; while James Rustad, who works for The Moving Picture Company, worked on the helicopter computer-generated effects in the climactic scene of *Skyfall*, and has previously worked on films including *Man of Steel*.

There is a strong research culture within the School, both at MSc and PhD level. Liz Valentine, followed her undergraduate degree in Multimedia Technology and Design with a research Master's. For her Master's, Liz worked on a mobile museum guide for the Museum of Canterbury, which won several top awards in the BEA (Broadcasting Education Association) Festival of Media Arts.

After her studies, Liz worked as a researcher, a freelance multimedia producer and a developer, and in 2009 became a Research Scientist within BBC Research and Development, where she researches current and future trends with relation to technology and media. Liz is able to implement the knowledge that she gained studying at Kent and has the satisfaction of knowing that her research guides current and future technologies, which will either help people to make programmes and other content, or to consume it – as such, it will have an impact on people all over the country.

The School also has an international reputation for its research in information security and biometrics. Raluca Vasilachi, a graduate of the MSc in this area has found her studies at Kent to be of invaluable help in her career. She works for Accenture Technology Labs, Accenture's research and development arm, where she is involved with the development of innovative biometric solutions such as Automated Border Clearance, and the introduction of biometric visas and residents' cards. Raluca finds this expanding field fascinating and is happy to recommend Kent: 'I would encourage anyone with an interest in IT security to look closely at Kent's Information Security and Biometrics MSc and this exciting topic'.

These are just some examples of our graduates' successes; for more, see our website www.eda.kent.ac.uk/school/alumni-case_studies.aspx

TAUGHT PROGRAMMES

There is a range of programmes available within the School, which allows you to choose the programme which bests reflects your interests. Below we list the programmes on offer.

Advanced Electronic Systems Engineering MSc

Location: Canterbury
Attendance: One year full-time
Start: September
Entry requirements: A 2.2 or higher honours degree in electronics, computing or related electronics subject.

This programme reflects the latest developments in electronic system design and illustrates the use of electronic systems technologies in instrumentation, measurement and control. You develop the skills to design and build complex electronic systems, in a wide range of applications, using the appropriate technologies and techniques.

We have developed the programme with a number of industrial organisations, which means that successful students will be in a strong position to build a long-term career in this important discipline.

Core modules

- Advanced Control Systems
- Communication Networks
- Computer and Reconfigurable Architectures
- Research Methods and Project Design
- MSc Project

You choose one further module from:

- Advanced Pattern Recognition Techniques
- Advanced Sensors and Instrumentation Systems
- Embedded Real-time Operating Systems
- Fundamentals of Image Analysis.

Assessment

Assessment is by examination and coursework.

Architectural Visualisation MA

Location: Canterbury
Attendance: One year full-time
Start: September
Entry requirements: A first or 2.1 honours degree in architecture, animation or a multimedia-related discipline or similar (or equivalent).

This programme is taught jointly with Kent School of Architecture. You develop the technical expertise and advanced knowledge and understanding of digital simulation and 3D modelling that allows you to operate as a skilled professional in architectural visualisation.

Modules

- Digital Visual Art Set-up (intensive four-week introductory course)
- Digital Architecture Set-up
- Film and Architecture
- High-Definition Compositing
- High-Definition Video
- Virtual Cities
- Professional Group Work
- Master's Project

Assessment

Assessment is by coursework.

Broadband and Mobile Communication Networks MSc

Location: Canterbury
Attendance: One year full-time
Start: September
Entry requirements: A 2.2 or higher honours degree in electronics, computing or related electronics subject.

The University has been at the forefront of research activities into the technologies that power broadband and wireless communications for over 20 years. This programme is underpinned by this research and reflects the latest developments in the telecommunications industry, providing high-quality systems level education and training.

The programme takes advantage of our extensive contacts with industry and includes a number of industrial seminars presented by outside speakers to ensure students are up-to-date with current techniques and issues.

This programme begins in late September and finishes in September the following year.

Modules

- Broadband Networks
- Communication Networks
- Communication Systems
- Digital Signal Processing
- Research Methods and Project Design
- Signal and Communication Theory
- Wireless/Mobile Communications
- MSc Project

Assessment

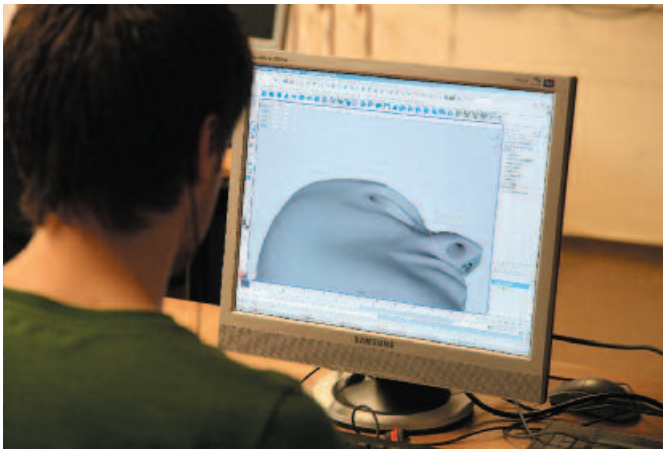
Assessment is by examination and coursework.

Computer Animation MSc

Location: Canterbury
Attendance: One year full-time
Start: September
Entry requirements: A first or 2.1 honours degree in multimedia, art or design or a related subject. All applicants must present a portfolio.

This programme was developed in collaboration with Framestore, the largest visual effects and computer animation company in Europe. The programme is entirely oriented towards current industrial needs, technology and practice, and aims to provide a direct route into a desirable and high-profile creative industry.

The first part of the programme covers 3D animation practice and principles, the animation pipeline, drawing skills for the time-based 3D medium, storyboarding for animation, the language of film and character animation. The second part of the programme is based on project work. Two projects are undertaken, a group project of four weeks duration followed by an individual or group project, which forms a suitable entree to a professional career.



Projects are professional briefs carried out in the School's computer animation suite under expert supervision and with monthly reviews with industry professionals.

Modules

- Digital Visual Art Set-up (intensive four-week introductory course)
- Acting in Animation
- Action in Animation
- Advanced 3D Modelling
- Animation Principles
- Computer Animation Project
- Previsualisation
- Professional Group Work
- Visual Training

Assessment

Assessment is by coursework.

Digital Visual Effects MSc

Location: Canterbury
Attendance: One year full-time
Start: September
Entry requirements: A first or 2.1 honours degree in multimedia, art or design or a related subject. All applicants must present a portfolio.

This programme is entirely oriented towards current industrial needs, technology and practice, and aims to provide a direct route into a desirable and high-profile creative industry. We work closely with industry professionals from studios such as MPC, Double Negative and Cinesite to ensure the programme remains relevant to industry needs.

The first part of the programme covers 3D model building, texturing, lighting, rendering, procedural

TAUGHT PROGRAMMES (CONT)

animation (cloth, hair, fur, dynamics), advanced compositing and high-definition digital effects. The second is based on project work. Two projects are undertaken, a four-week group project followed by an individual or group project, which forms a suitable entree to a professional career.

Projects are professional briefs carried out in the School's visual effects and computer animation suite under expert supervision and with monthly reviews with industry professionals.

Modules

- Digital Visual Art Set-up (intensive four-week introductory course)
- Advanced 3D Modelling
- Effects Animation
- High-Definition Compositing
- High-Definition Video
- Previsualisation
- Professional Group Work
- Technical Direction
- Master's Project

Assessment

Assessment is by coursework.

Embedded Systems and Instrumentation MSc

Location: Canterbury
Attendance: One year full-time
Start: September
Entry requirements: A 2.2 or higher honours degree, or alternative international qualification recognised as equivalent, in electronics, computer science or a related engineering or science subject.

This programme reflects the latest developments in embedded system design and illustrates the use of embedded system technology in instrumentation, measurement and control. You develop the skills necessary to develop embedded systems using a variety of different technology platforms and use them in a wide range of applications.

We have developed the course in collaboration with a number of industrial organisations, which puts you in a strong position to build a career in this important area.

Modules

- Advanced Control Systems
- Advanced Sensors and Instrumentation Systems
- Communication Networks
- Computer and Reconfigurable Architectures
- Digital Signal Processing
- Embedded Real-Time Operating Systems
- Research Methods and Project Design
- MSc Project

Assessment

Assessment is by examination and coursework.

Engineering with Finance MSc

Location: Canterbury
Attendance: One year full-time
Start: September
Entry requirements: A first or good second class honours degree (or the equivalent) in an engineering, scientific, computing or similar discipline. Applicants should also have a proven mathematical ability and knowledge of the basics of statistics and probability.

This is the first MSc in quantitative finance offered by a UK engineering department and provides a balanced mix of subjects in engineering and quantitative finance. It has been designed mainly for engineering graduates who wish to pursue a career in finance. While a significant proportion of graduates working in the financial sector have an engineering background, most of the relevant MSc programmes are offered by mathematics departments or business schools. Some engineers may find these programmes either too theoretical or not quantitative enough.

Our MSc in Engineering with Finance, instead, teaches concepts of finance at the level suitable to engineers, while also providing strong knowledge of quantitative methods to analyse real data.

You acquire skills required by investment analysts, financial analysts, stockbrokers and market risk specialists.

Modules

- Advanced Control Systems
- Advanced Pattern Recognition Techniques
- Digital Signal Processing
- Financial Engineering
- Portfolio Theory and Asset Pricing Models for Engineers
- Probability and Statistics for Finance
- Project Design
- Strategic Analysis of Financial Systems
- MSc Project

Assessment

Assessment is by examination and coursework.

Information Security and Biometrics MSc

Location: Canterbury
Attendance: One year full-time
Start: September
Entry requirements: A 2.2 or higher honours degree (or equivalent) in a subject with a strong IT component. We assess applicants on an individual basis, with professional experience taken into consideration.

This programme is taught jointly with the School of Computing. Both schools are at the forefront of research in their areas: the School of Engineering and Digital Arts has an excellent reputation for research in various aspects of biometrics, including individual biometric modalities, the management of the complexity arising from the design of flexible biometric systems, and the testing and evaluation of biometrics; while the School of Computing has participated in the development of the X.509 international standard and was the first group in the world to build an X.509 privilege management infrastructure (PMI).

The programme is designed for practitioners, professionals and graduates, and provides a thorough understanding of the theories concepts and techniques for the design, development and effective use of secure information systems.

Modules

- Biometrics Technologies
- Computer Security
- Fundamentals of Image Analysis

CONTINUED OVERLEAF

TAUGHT PROGRAMMES (CONT)

- Research Methods and Project Design
- MSc Project

You choose two further modules from those listed below:
- Advanced Java Programming
- Advanced Pattern Recognition Techniques
- Advanced Sensors and Instrumentation Systems
- Computing Law, Contracts and Professional Responsibility
- Industrial Context of Biometrics: Standards, Object-Oriented Programming, Testing and Evaluation of Biometric Systems
- System Security
- Trust, Security and Privacy Management.

Assessment

Assessment is by examination and coursework.

Mobile Application Design MSc

Location: Canterbury
Attendance: One year full-time
Start: September
Entry requirements: A 2.2 or higher honours degree in an engineering, multimedia, scientific, computing, or similar discipline. Applicants should also be familiar with object-oriented programming methodology.

This programme combines technology, interface design and application development for mobile platforms, with a particular emphasis on developing iPhone and iPad apps and creating apps with high usability and reliability. All students are provided with a personal MacBook Pro for the duration of the course. On completion of the course, you will have gained the expertise necessary for success in this rapidly expanding and developing field.

The MSc begins in late September and finishes in September of the following year, and consists of approximately six months of coursework followed by a short period reserved for examinations and a four-month project.

Modules

- HCI for Mobiles
- iPhone Application Design
- Mobile Application Design Project
- Mobile Web Development
- Research Methods and Project Design for Mobile Applications
- MSc Project

You choose two further modules from those listed below:
- Economics of the Electronic Marketplace
- Embedded Real-Time Operating Systems
- Object-Oriented Programming.

Assessment

Assessment is by examination and coursework.

Wireless Communications and Signal Processing MSc

Location: Canterbury
Attendance: One year full-time
Start: September
Entry requirements: A 2.2 or higher honours degree in electronics, computing or related electronics subject.

This programme reflects the latest developments in the wireless communications industry, with particular emphasis on digital signal processing using embedded systems. You develop advanced skills in the application of modern embedded systems design at hardware, software and firmware levels using practical examples in wireless communication to illustrate the technology. Successful completion of this programme ensures you are well placed to develop a career in the mobile/wireless communications industry.

The MSc begins in late September and finishes in September of the following year, and consists of lectures, laboratories and project work, with the summer being devoted fully to the latter.

Modules

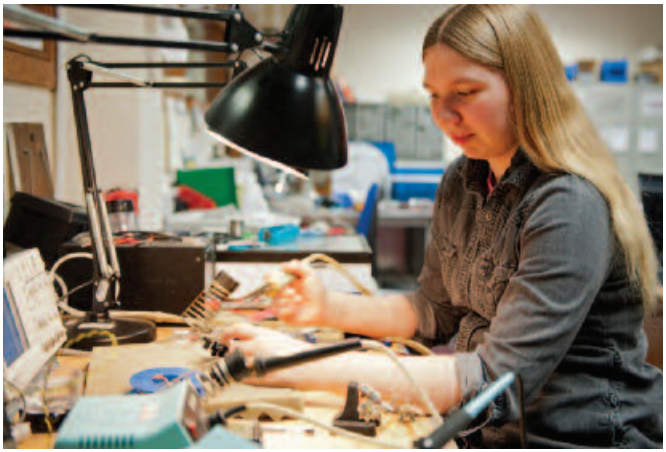
- Communication Networks
- Computer and Reconfigurable Architectures
- Digital Signal Processing
- Embedded Real-time Operating Systems
- Research Methods and Project Design
- Signals and Communication Theory
- Wireless/Mobile Communications
- MSc Project

Assessment

Assessment is by examination and coursework.

TAUGHT MODULES

Below is a list of modules currently on offer on taught programmes in the School of Engineering and Digital Arts.



Acting in Animation

You develop an understanding of how thoughts and emotions are clearly and engagingly conveyed using 3D character models. In order to be a good character animator, you must not merely copy performances and reproduce them; you must be an actor through the technology and the techniques available to the animator.

Action in Animation

You look at the techniques used to produce articulate motion which is life-like and convincing – this is the base of both comedic cartoon animation and realistic animation for compositing, for example, in creating stunts or armies for action and historical spectaculars, where cost or danger prohibit live shooting.

Advanced 3D Modelling

You study character design and animateable geometry, advanced UV surface mapping, fine surface detail and polygonal geometry, and the creation and application of sculpted detail. You also look at the practical aspects of handling large image and texture files.

Advanced Control Systems

This module is concerned with the design of practical feedback controllers and robust control. Feedback is used in a control system to enhance the performance of the plant or process, and to reduce the sensitivity of the system to uncertainty from external effects (for example, disturbance signals and noise on measurements) and model uncertainty. The control is said to be robust if the performance specifications are achieved in the presence of the expected uncertainties.

Advanced Java for Programming

This module provides for well-qualified computer science students entering the MSc programme from a range of backgrounds. You will have good programming skills but not necessarily have used Java or another object-oriented language extensively. This module seeks to ensure that you have the Java and object-oriented design skills necessary for the rest of your programme.

Advanced Pattern Recognition Techniques

You study advanced methods for pattern recognition with an emphasis on multi-source systems. A detailed analysis of the Bayesian classification framework is followed by an introduction to error estimation and advanced feature selection and extraction techniques, and their application to financial data and systems. Multiple classifier systems, including intelligent and dynamically adaptable classifier combination strategies, such as genetic algorithms, are studied as the basis for the development of state-of-the-art systems.

Advanced Sensors and Instrumentation Systems

In this module, you cover modern sensors and advanced measurement systems for a diverse range of industrial applications. General measurement principles

TAUGHT MODULES (CONT)

and concepts are introduced. The module focuses on digital imaging and intelligent measurement and monitoring techniques. Real-life industrial case studies are included to enhance your learning experience in the design and applications of cutting-edge instrumentation technologies.

Animation Principles

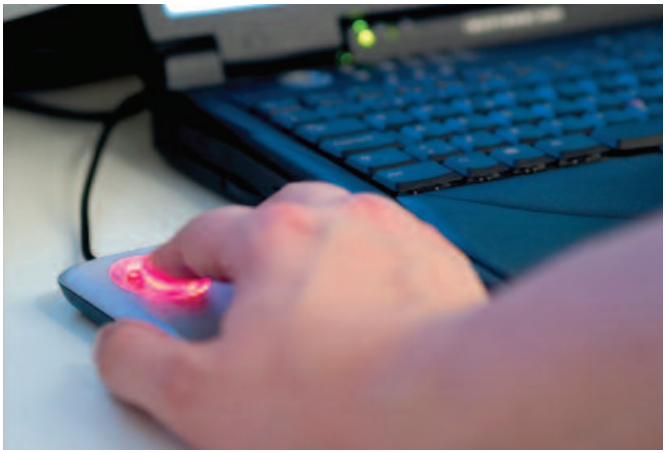
Animation Principles is concerned with fundamental animation concepts. Originally developed by Hollywood animators in the 1940s, these principles have been derived from classical drawn animation and model animation, transposed into the digital medium. Topics covered include: rules of thumb, bouncing ball, weight, line of action, secondary animation and effects.

Biometrics Technologies

This module includes a detailed treatment of the implementation of biometric systems including examples of systems using the major modalities and an analysis of modality-specific features and feature extraction, selection and classification strategies.

Broadband Networks

In this module, you acquire knowledge of broadband network operation, from access networks (xDSL, WiMAX, DOCSIS) to multi-service provision in IP networks using differentiated services, MPLS, reservation protocols (such as RSVP) and protocols for real-time information transfer (RTP/RTCP), to optical networking and switching.



Communication Networks

This module takes you through communication network protocols, as used in local-area networks and wide-area networks. It includes the protocols used in the wireless LAN (WiFi) standards, Ethernets, and IP networks. The analysis of network performance is also covered. A network simulator (OPNET) is used to reinforce the material, and to provide you with a means of visualising protocol operation and network performance.

Communication Systems

This module introduces and builds upon the physical aspects of communications and applies them to microwave satellite, mobile terrestrial and optical systems. Problem solving and computer simulation are used to enhance understanding.

Computer Animation Project

You build a show reel where all the techniques that have been learnt over the course are applied. Your project contains sophisticated, original articulate animation showing a large variety of motion and emotion to a professional standard. The subject is either your own concept developed with the help of your supervisor, or a brief from an industry professional. The work in this module accounts for one third of your programme.

Computer and Reconfigurable Architectures

You are introduced to computer architectures including CISC, RISC and VLIW. FPGA technology is used to describe different forms of reconfigurable computing architectures that are important for many applications. Specific emphasis is given to computer arithmetic architectures and

methods used in the design of embedded systems. The module uses practical design examples developed in C and VHDL to illustrate the material.

Computer Security

You study cryptographic algorithms including symmetric and asymmetric techniques and the distinction between encryption and signatures. You also look at mechanisms to provide security such as firewalls and VPNs. The module also covers distributed mechanisms, including client authentication, public key infrastructures and certification, digital rights management systems and the security of Wi-Fi networks.

Computing Law, Contracts and Professional Responsibility

This module is concerned with the complex issues of contract law, legal processes and data privacy legislation. You acquire a practical understanding of computer law.

Digital Architecture Set-up

You are guided through the procedures of modelling and animation needed for architectural visualisation. The module compares the available software packages used in industry and gives you hands-on ability to model, animate and render architectural animations.

Digital Signal Processing

You acquire a solid background in signal analysis, frequency and time domain representations using MATLAB. You learn techniques including: aliasing, anti-aliasing and anti-imaging filters, ADCs and DACs, discrete Fourier transform and fast Fourier transform, Laplace transform, pole-zero placement methods for signal analysis, design and performance of finite impulse response and infinite impulse response (IIR) filters. Examples on how these techniques are applied to financial data are provided.

Digital Visual Art Set-up

This module has been designed to get all students up to speed regarding the complicated technical processes that surround current animation practice. It covers the skills and procedures employed professionally such as modelling, rigging, skinning, muscle dynamics, texturing and lighting.

Effects Animation

The skills of the Technical Director in 3D animation rely on attention to detail, and setting up models so that they react accurately within a scene. In this module, you learn how to rig any model to automate secondary animation components such as doors opening and wheels turning, accurately and controllably. Teaching is therefore focused around the development of fully rigged 3D models.

Embedded Real-Time Operating Systems

You study the concepts of scheduling algorithms, threads, multitasking and inter-process communication in detail using practical examples and case studies. The module also includes advanced topics in hardware/software co-design together with a review of compilation technologies and compiler techniques for specialised architectures.

Film and Architecture

You review the representation of architecture in film. With light being such an important factor in both disciplines, the links between the industries are explored, analysing films from early German expressionist cinema through to present-day utopian/dystopian films. You investigate how the cinematic projection of architecture can alter the character of the built environment and the way it is portrayed. You also explore the relationship of architecture to lens, and screen to audience.

Financial Engineering

You are given a comprehensive overview of theoretical and practical aspects of financial engineering. You gain a solid foundation in statistics applicable to finance: regression analysis, least squares, nonlinear regression and multiple regression analysis. You also learn how to apply econometrics models to financial data.

Fundamentals of Image Analysis

This module focuses on image processing; image acquisition, quantisation and representation. It also covers the fundamentals of pattern classification and the role of classification in a variety of application scenarios, including security and biometrics.

CONTINUED OVERLEAF

TAUGHT MODULES (CONT)

HCI for Mobiles

This module is concerned with designing mobile applications, taking into account usability, accessibility and sociability. You evaluate current and future trends of interaction design and interface technologies in a mobile context, and develop an understanding of the differences between interaction design for desktop and mobile platforms.

High-Definition Compositing

This module specifically addresses the technical and artistic requirements for compositing video and 3D elements at a high resolution. Compositing is the artistic blending of several disparate elements from a variety of sources into a single image, while making all the component elements appear to be in the same light space and shot with the same camera.

High-Definition Video

This module includes a sequence of practical workshops which introduce the filming techniques and editing tools used on the course. These are supported by a series of lectures concerned with high-definition video technology. You gain an understanding of the theory and standards of colour models, and how they are applied to motion imaging in video, HDTV and digital-cinema, and become familiar with the relevant broadcast and compression standards that are used for high-definition digital video.

Finally, you work as part of a small team to produce a short digital film, in high definition.

Industrial Context of Biometrics

You examine the importance of standards and regulation in biometric systems and look at associated standardisation bodies and procedures. Issues related to data collection, volunteer sampling and ethical issues are also addressed. Alongside the module, a number of industry-led colloquia introduce you to the current industrial context.

iPhone Application Design

This module is concerned with the design, implementation and testing of applications for the iPhone and iPad. You work at all stages of the development life-cycle from inception to testing, while considering usability and device capabilities for a mobile application capable of meeting a functional specification.

Mobile Web Development

This module is concerned with developing websites and applications for the mobile web browser and includes an overview of the four main mobile platforms: RIM, iPhone, Windows 7 Phone and Android.

MSc Project

For Advanced Electronic Systems Engineering; Broadband and Mobile Communication Networks; Embedded Systems and Instrumentation; Engineering with Finance; Wireless Communications and Signal Processing

The project may be carried out in industry or at the University. For industry-based projects, an

industrial supervisor is responsible for day-to-day technical supervision, while your academic supervisor advises on the requirements for University assessments. University-based projects may be industrially sponsored or undertaken within one of the School's research groups. The project is assessed through presentations, and a dissertation at the end of the project period.

MSc Project

For Mobile Application Design
You begin your MSc project at the end of May/beginning of June and complete it in mid-September (if you are studying full-time). You concentrate solely on your project during this time, which enables you to produce an advanced, successful project. The project is examined mainly through a dissertation, but also through a final presentation.

Projects may be carried out in the research laboratories of the School, within research teams under the supervision of an academic member of staff, or may be carried out in industry. In the latter case, an academic supervisor provides general guidance, particularly on meeting the requirements of the dissertation and presentation, while an industry supervisor provides detailed, day-to-day technical guidance. Some projects carried out within the research laboratories of the School may also be industry-sponsored.

Master's Project

For Architectural Visualisation; Digital Visual Effects
Using the experience gained on the course, you produce a video short in high definition, which showcases your professional visual effects skills and forms an entree to a professional career. The subject, script, models and soundtrack of the piece are agreed with the academic staff, or could be a project from an industrial collaborator.

MSc Project

For Information Security and Biometrics
Your project gives you practical experience of the design of a significant biometric or information security system. Projects may involve working closely with an industrial collaborator, which will provide experience of secure systems design in an industrial environment, allowing you to appreciate the practical difficulties in the development and utilisation of such systems. The project may be carried out in industry or at the University.

Portfolio Theory and Asset Pricing Models for Engineers

You are introduced to current theories on portfolio management and developing asset models to assist risk management of financial services firms. You study: efficient market hypothesis, measures of investment risk, portfolio theory, models of asset returns, asset pricing models, Brownian motion, martingales, stochastic calculus, Ito processes and stochastic models of security prices.

Previsualisation

You are given intensive exposure to the current British and international film and television industry and discover how your specialism is practically carried on within it. You tour two or three digital post-production animation studios in London and interview current industry professionals. On the basis of their advice, you develop a plan, including a previsualisation, for your final project.

Probability and Statistics for Finance

You study applications of statistical theory and methods in finance using examples, and investigate and analyse the most commonly used methods and models. Topics studied include: multivariate variables and distributions, marginal and conditional distributions, independence, covariance, correlation, probability theory, discrete and continuous probability distributions, conditional probability and Bayes' Rule, hypothesis testing.

Professional Group Work

In this module, a series of group projects replicate the experience of working in a professional studio environment. In the spring term, you complete a series of one-day group projects which contribute to and lead into your major project, where

TAUGHT MODULES (CONT)

all animation, digital effects and architectural visualisation students work together to produce an animation and effects shots. Working in a simulated professional environment to a four-week deadline, you become familiar with the production process, chains of approval and departmental divisions.

Project Design

This module prepares you for the Master's Project and for possible future research work. It begins with an introduction to MATLAB and SIMULINK, which are tools used in most taught Master's modules at Kent. It also includes details about how to write a literature review and produce a viable project plan. You learn how to use tools such as RefWorks and EndNote to produce and maintain reference databases.

The module also addresses important issues concerning the definition of a project and the consideration of ethical and intellectual property issues. Techniques and guidelines for writing clear and concise English are discussed in detail.

Research Methods and Project Design

For Advanced Electronic Systems Engineering; Embedded Systems and Instrumentation; Engineering with Finance; Information Security and Biometrics; Mobile Application Design

You gain a thorough appreciation of the methodologies of research, which are essential to engineers involved in research and development projects. The module includes lectures on literature surveys, research project management, the research process, computer-based data analysis, research publications, presentation skills, intellectual property rights (IPR) and research ethics. In addition, working under the direction of your project supervisor, you write a full project proposal prior to the start of your MSc project.

Research Methods and Project Design

For Broadband and Mobile Communication Networks

You acquire the skills necessary for your project, and complete the background learning and initial design stage.

Research Methods and Project Design

For Wireless Communications and Signal Processing

This module introduces you to skills related to your project work, and comprises the background learning and initial design stage of your project.

Signal and Communication Theory

You study optimal receiver design, advanced modulation such as QAM, transmission and performance analysis over wireless multipath fading channels, spread spectrum and multicarrier transmission, and advanced channel coding such as Turbo and LDPC coding. SIMULINK modelling of a digital communication system is used to enhance your understanding of how the concepts are applied.

Strategic Analysis of Financial Systems

You work in small groups to research a real-world financial topic. You read financial journal articles, collect relevant financial data and use applied mathematical methods, such as technical analysis indicators and portfolio theory models, to propose analyses and forecasts.

System Security

You develop an increased understanding of the motivation, design and operation of modern systems for encryption, authentication, authorisation and identification, and gain an awareness of the importance of taking a systems-wide approach to maintaining information security.

Technical Direction

This module is concerned with the use of lighting and shading for storytelling and visual communication. You gain an understanding of the fundamental, theoretical concepts in digital lighting as well as the necessary skills and experience to produce customised light and shading models, which provide aesthetic possibilities not available from off-the-shelf packages. Through this module, you become expert in the use of various renderers such as RenderMan and mental ray.

Trust, Security and Privacy Management

A holistic view of security management is taken, starting with risk management and the formulation of security policies. Technical subjects include a description of the various security models, digital rights management, and an illustration of how authorisation policies can be automatically enforced.

Virtual Cities

You develop skills in visual communication and presentation dealing with 3D computer modelling, as well as modelling skills, learning materiality, lighting and high-quality rendering skills. The module draws from professional practice in a number of industries, including architecture, film and games, highlighting the emphasis that each field places on the modelling and rendering process.

Visual Training

The exact configuration which makes up a particular facial expression, the exact state of the muscles of a body under different circumstances, the exact nuance of meaning conveyed by different gesture positions, are all elements that go to distinguish superior from mediocre animation. The most effective way to develop such observational and outputting skills is through traditional drawing and sculpture, which is frequently reflected in studio hiring policies. This module uses traditional art techniques to develop your digital animation abilities.

Wireless/Mobile Communications

Here, the latest mobile and wireless communication technologies, techniques and protocols are covered, particularly cellular networks such as 3G and 4G mobile systems. The latest protocols for next generation wireless networks, and the techniques which will enable them, such as microcellular mobile concepts and interference, adaptive modulation and coding, soft handoff, wireless multiple access techniques, multiuser diversity/scheduling, wireless resource allocation and MIMO systems, are also covered.

STAFF PROFILE

Professor Yong Yan is Professor of Electronic Instrumentation and Director of Research at the School of Engineering and Digital Arts. He is an IEEE Fellow and has won a number of awards for his work.

What do you like about teaching at Kent?

The campus is beautiful and the relaxed environment makes it a good place to work and study. More important though is the collegiate academic environment at Kent.

What do you think Kent has to offer postgraduate students?

Many things. The staff here are very committed and professional. There is a strong academic culture that has been built up over many years. The School also has excellent IT facilities, a well-resourced mechanical workshop and several recently upgraded laboratories, which allow our students to test their ideas in a practical way.

Our research students benefit from being supported by a team of people; usually a first and second supervisor as well as the head of the relevant research group who acts as a supervisory panel chair.

Our research groups hold regular seminars so that students can learn not just about their topic but about other areas of interest within their field. We also invite external researchers to give presentations on their work. Biannually, we organise a research conference at the School, where students gain experience of networking and socialising with academics and many have the opportunity to present their work and exchange ideas with fellow researchers.

Also, each PhD student is financially supported by the School to participate in at least one major international conference (normally outside the UK) during their studies.

What do you enjoy about working with postgraduates?

First, I get a tremendous sense of professional satisfaction from the feeling that I am training the engineers and academics of the future; I really enjoy it.

Second, I enjoy being part of a team. A project works best when there is a good mix of experienced and young researchers who are keen to learn.

Does your research feed into your teaching?

Absolutely. When I teach Master's students, I use real-life case studies in my lectures to illustrate how the theory works in practice. These case studies are often derived from research projects we are working on and the students enjoy the fact that the knowledge they are gaining is very current. The majority of our Master's and PhD projects are based on externally funded or industry-sponsored research.

How do the School's links with industry and business work?

We have been working closely with industry for many years and have built up an excellent international reputation so people come to us looking for solutions. In the area of instrumentation, we undertake applied research in collaboration with the power generation industry and also with companies and organisations in the health care sector. We involve our students in this type of research and they enjoy working on real projects, testing their ideas on a full-scale power plant or in a clinical environment. For students, knowing their work can make a difference in the real world is a great incentive and good for their future careers.

The School has established excellent links with China. How did that come about?

I did my first degree and Master's degree in China and my PhD in the UK so I know both education systems well. Collaborating with Chinese institutions in both research and teaching is part of our internationalisation strategy. We have several joint research projects with leading universities in China, including Zhejiang, Tianjin and Xi'an Jiaotong universities. We have received funding for collaborative research from various sources in the UK and China. Such collaboration is beneficial to both sides and enhances our international reputation.

RESEARCH DEGREES

The School of Engineering and Digital Arts is engaged in high-quality research with significant national and international impact, offering excellent opportunities for graduate studies.

We have consistently attracted substantial research funding from the UK Research Councils, European research programmes, industry, commercial companies, government agencies and others, and our spread of expertise allows us to respond rapidly to new developments.

We offer higher degree research programmes on a full-time or part-time basis. We have a thriving student population studying for postgraduate degrees in a notably friendly and supportive learning environment within a dynamic research culture. The skills, abilities and enthusiasm of our students are vital elements in our research activities and we foster them as effectively as we can through the provision of an excellent research training programme during their graduate studies.

Our research programmes

The School offers the following research degree programmes:

- Electronic Engineering MSc, MPhil, PhD, EngD
- Digital Arts MSc, MPhil, PhD.

Entry requirements

A first or 2.1 honours degree in electronics, computing or a related electronics subject.

Collaboration with industry

The School has established strong industrial links, which are used extensively to deliver and enhance your research project. Industrial seminars are regularly presented by outside speakers, ensuring that you are aware of current techniques and trends within the industry.

Research groups

As a postgraduate research student, you will join one of our four research groups.

Broadband and Wireless Communications

The Group's research interests include antennas, microwave and millimetre wave circuits and measurements and optoelectronics. The Group's work has attracted significant funding from the Engineering and Physical Sciences Research Council (EPSRC) and industry of over £2 million in the past five years. Over £1.1 million has been invested in equipment recently.

The antennas research covers frequency selective surfaces, printed and microstrip antennas and photonic band gap materials. Work covers frequencies ranging from 1MHz to 900GHz and finds applications in vehicle telematics, mobile communication systems and radar and satellite technology. Research into high frequency transmission lines and circuit integration is developing novel guiding and packaging technology. Modelling and simulation tools are widely used in the research, verified by experimental work.

The research carried out in the field of optoelectronics includes work on optical communications systems, optical sensors and imaging and novel optical components and is based in both the School of Engineering and Digital Arts and the School of Physical Sciences. The aggregation of optoelectronic activities significantly strengthens our research base in terms of knowledge cross-fertilisation and equipment and facilities. It is part of a long-standing strategy of collaboration between physicists and engineers.

Instrumentation, Control and Embedded Systems

This Group comprises a mixture of experienced and young academics, working in complementary research themes – Instrumentation, Control and Embedded Systems. The Group has established a strong reputation in recent years in solving challenging scientific and technological problems across a range of industrial sectors.

The Group has links with many European countries through EU-funded research programmes.

CONTINUED OVERLEAF

RESEARCH DEGREES (CONT)

The main expertise of the Group lies in sensors, instrumentation, condition monitoring, control, image processing, signal processing, neural networks and systems on chip.

There is a well-equipped Instrumentation Research Laboratory in which there are a number of flow and combustion test rigs. The Group is also involved in medical instrumentation research in the area of non-invasive physiological measurement; mostly carried out in collaboration with clinicians, who are experts in their field.

The Group has strong links with the Electronic Systems Design Centre, which is linked to the School and actively promotes industrial collaboration and technology transfer in embedded system design.

Image and Information Engineering

The Image and Information Engineering Research Group has wide interests in developing techniques for image processing, image analysis, pattern recognition, and in applications of these techniques. A principal area of interest is the development of generic techniques for optimal multi-classifier design for pattern recognition applications. Handwriting analysis is not only an application domain of intrinsic interest but is also relevant to other important areas of research. For instance, it can be valuable in assessing neurological functioning in clinical environments, in the assessment of stroke patients and in the analysis of developmental co-ordination disorder in children.

Document processing, with particular emphasis on document security (including document structures to support secure transactions) and distributed electronic documents, digital watermarking and intelligent encryption is a related strand of work. In addition, formal specification techniques in artificial neural system design represent an important contribution to work on classifier implementation. Currently, however, a major research theme is in biometrics and security. Biometrics of particular interest include fingerprint, facial images, iris patterns, handwriting and personal signature analysis. Additional areas of interest include colour and texture processing, face detection and recognition (2D and 3D), image compression, video annotation, visual guidance and tracking.

Our links with industrial organisations and our wide interaction with other researchers in Europe and worldwide provide excellent opportunities for maintaining state-of-the-art awareness and for broadening horizons.

Digital Media

The Group's particular strength is in emerging digital technologies, including 3D virtual worlds, natural user interfaces (including gesture and facial interactions) and cutting-edge interaction paradigms (eg brain-computer interfaces and eye-tracking technology). The Group has substantial experience in interaction design (eg usability and accessibility), social computing (eg social networking and computer mediated communication), mobile technology (eg iPhone, android, tablet computing) and video games, particularly in serious games.

Apart from these areas, the Group also focuses on standard technologies, such as web design and development, including e-commerce, e-learning, e-health. In the area of time-based media, the Group has substantial interest in digital film capture, editing and manipulation, on to fully animated 3D modelling techniques as used in games and feature films.

The Group is linked to the Digital Media Hub, which brings together the creativity of the School's academics and students with businesses in the region.

ACADEMIC STAFF

The School of Engineering and Digital Arts comprises 32 academics who support teaching and research across a range of areas.

Full details of staff research interests can be found on our website: www.eda.kent.ac.uk/school/staff_directory.aspx

Dr (Jim) Chee Siang Ang

Lecturer in Multimedia/Digital Systems
Human computer interaction; usability and playability design; computer game studies and interactive narrative; social computing and sociability design; virtual worlds; online communities and computer-mediated communication.

Dr John Batchelor

Reader in Antenna Technology
Design and modelling of multi-band antennas for personal, on-body and mobile communication systems; passive RFID tagging/sensing and skin mounted transfer tattoo tags; reduced-size frequency selective structures (FSS and EBG) for incorporation into smart buildings for control of radio spectrum.

Ania Bobrowicz

Senior Lecturer in Digital Arts
Human-computer interaction; computer-mediated communication; feminism and art history.

David Byers Brown

Senior Lecturer
Animation; digital visual effects; directing.

Dr Farzin Deravi

Reader in Information Engineering
Pattern recognition; information fusion; computer vision; image processing; image coding; fractals and self-similarity; biometrics; bio-signals; assistive technologies.

Dr Christos Efstratiou

Lecturer in Social/Ubiquitous Computing
Context aware electronic guides; systems to monitor health and safety.

Professor Michael Fairhurst

Professor of Computer Vision
Image analysis; computer vision; handwriting analysis; biometrics and security; novel classifier architectures; medical image analysis and diagnostics; document processing.

Professor Steven Gao

Professor of RF/Microwave Engineering
Space antennas, smart antennas, microwave circuit and systems.

Dr Nathan Gomes

Reader in Broadband Communications
Optical-microwave interactions, especially fibre-radio networks; optoelectronic devices and optical networks.

Dr Richard Guest

Senior Lecturer in Multimedia Technology and Design
Image processing; biometrics technologies including usability, cybermetric linkages and standardisation; automated analysis of handwritten data; document processing.

Dr Sanaul Hoque

Lecturer in Secure Systems Engineering
Computer vision; OCR; biometrics; security and encryption; multi-expert fusion and document modelling.

Dr Benito Sanz Izquierdo

Lecturer in Electronic Systems
Antennas and microwaves.

Dr Gareth Howells

Senior Lecturer in Electronic Engineering
Biometric security and pattern classification techniques, especially deriving encryption keys from operating characteristics of electronic circuits and systems.

Stephen Kelly

Senior Lecturer in Electronic Engineering
Medical electronics, including: electrocardiology; speech assessment; telemedicine and computer-based assessment of clinical conditions.

CONTINUED OVERLEAF

ACADEMIC STAFF (CONT)

Peter Lee

Senior Lecturer in Electronic Engineering
Embedded systems; programmable architectures; high-speed signal processing; VLSI/ASIC design; neural networks; optical sensor systems and applications; image processing using VLSI.

Dr Gang Lu

Senior Lecturer in Electronic Instrumentation
Advanced combustion instrumentation; vision-based instrumentation systems; digital image processing; condition monitoring.

Dr Gianluca Marcelli

Lecturer in Engineering
The understanding of complex systems, in particular, biological and financial systems; using mathematical modelling such as molecular simulation, Brownian dynamics and network theory.

Dr Richard Misek

Lecturer in Digital Media
Screen technologies and aesthetics; post-production; remix cinema; digital spacetime; urban space; video art.

Robert Oven

Lecturer in Electronic Engineering
Modelling of ion implantation processes and ion diffusion into glass for integrated optic applications.

Professor Ted Parker

Professor Emeritus of Radio Communications
Microwave antennas; frequency selective surfaces for microwave and millimetre wave multiband antennas (dichroics); radomes and frequency dependent screening for secure buildings.

Dr Matthew Pepper

Senior Lecturer in Electronic Engineering
Medical instrumentation; in particular in-shoe force measurement for gait analysis and rehabilitation engineering.

Dr Konstantinos Sirlantzis

Lecturer in Image Processing and Vision
Pattern recognition; multiple classifier systems; artificial intelligence techniques; neural networks, genetic algorithms and other biologically inspired computing paradigms; image processing; multimodal biometric models; handwriting recognition; numerical stochastic optimisation algorithms; nonlinear dynamics and chaos theory; Markov chain Monte Carlo (MCMC) methods for sensor data fusion.

Professor Mohammed Sobhy

Professor Emeritus of Electronics
Analysis and applications of nonlinear electronic systems.

Professor Sarah Spurgeon

Professor of Control Engineering; Head of School of Engineering and Digital Arts
Fundamental developments in the area of nonlinear control and estimation, with a particular interest in variable structure and sliding mode systems; industrial and biomedical application of nonlinear control and estimation techniques.

Dr Les Walczowski

Senior Lecturer in Electronic Engineering, Director of Learning and Teaching
The development of dynamic web applications, mobile applications and e-learning technology.

Winston Waller

Senior Lecturer in Electronic Engineering, Director of Enterprise
Design for test; analogue and digital VLSI design; medical applications of VLSI and low power voltage circuit design.

Dr Chao Wang

Lecturer in Electronic Systems
Optical communications, microwave photonics and biophotonics.

Professor Jiangzhou Wang

Professor of Telecommunications; Director of Graduate Studies

Modulation; coding; MIMO; mobile communications; wireless sensor networks. Recent publications include: *High-Speed Wireless Communications: Ultra-wideband, 3G Long Term Evolution, and 4G Mobile Systems* (2008).

Dr Xinggang Yan

Lecturer in Control Engineering

Nonlinear control; sliding mode control; decentralised control; fault detection and isolation.

Professor Yong Yan

Professor of Electronic Instrumentation; Director of Research

Sensors; instrumentation; measurement; condition monitoring; digital signal processing; digital image processing; applications of artificial intelligence.

Dr Paul Young

Lecturer in Electronic Engineering

Design and modelling of microwave and millimetre-wave devices and antennas, especially substrate integrated wave guides and smart antennas.

Dr Huiling Zhu

Lecturer in Communications

Wireless communications and networking, especially OFDMA, radio resource allocation, distributed antenna systems, wireless relay networks, user-centric networks, and co-operative communications.

APPLYING TO KENT

General entry requirements

If you wish to apply for a higher degree, you must normally have a first or second class honours degree in a relevant or appropriate subject, or the equivalent from an internationally recognised institution (for more information on requirements for international qualifications, visit www.kent.ac.uk/internationalstudent/country)

For specific entry requirements, please refer to individual programme entries.

English language

The University requires all non-native speakers of English to reach a minimum standard of proficiency in written and spoken English before beginning a postgraduate degree.

You should provide us with one of the following: an IELTS certificate with a minimum score of 6.5, including 6.0 in reading and writing, and 5.5 in listening and speaking; a TOEFL certificate with a minimum of 90, including 22 reading, 21 writing, 21 listening and 23 speaking (internet-based); or a Pearson Test of English Academic (PTE Academic) with a score of 62, including 60 in all four subtests.

If you do not reach the required standard, you can apply for one of our pre-sessional courses. For further information, please see www.kent.ac.uk/international-pathways

Only English language tests taken up to a maximum of two years prior to the date of registration will be accepted for admission to the University. Please note that if your university studies have been completed entirely in English, you may be exempt from providing an English test certificate. Please contact International Development for clarification (www.kent.ac.uk/internationalstudent/contact.html)

Making an application

You can apply for a Kent higher degree electronically via our website at www.kent.ac.uk/courses/postgrad/apply

If you do not have access to the web, please contact the Recruitment and Admissions Office for advice, see details right.

If you are applying for a research degree, it is strongly recommended that you contact the School of Engineering and Digital Arts in the first instance so that you have an opportunity to discuss your study plans with the programme director.

Application deadline

There is no fixed deadline for applications. We strongly recommend that you apply as soon as possible and no later than three months before the start of term. If you wish to apply for on-campus accommodation, an application must be made online by the end of July.

Tuition fees

For the most up-to-date information on tuition fees, visit www.kent.ac.uk/finance-student/fees

School enquiries

For further information, please contact:
Postgraduate Admissions Officer,
School of Engineering and Digital Arts,
Jennison Building,
University of Kent,
Canterbury,
Kent, CT2 7NT, UK

E: eda-admissions-pg@kent.ac.uk
T: +44 (0)1227 827323

Admissions enquiries

T: +44 (0)1227 827272
E: information@kent.ac.uk

GENERAL INFORMATION

European connections

Kent is known as the UK's European university. Our two main UK campuses, Canterbury and Medway, are located in the south-east of England, close to London, and we also have study locations in Brussels, Paris, Athens and Rome.

We have a diverse, cosmopolitan population with 140 nationalities represented. We also have strong links with universities in Europe, and from Kent, you are just over two hours away from Paris and Brussels by train.

World-leading research

A great deal of the University of Kent's research has been ranked as world-leading in terms of originality, significance and rigour, according to the Government's most recent Research Assessment Exercise (RAE, 2008). Kent staff were found to be engaged in research of international and world-class standing.

Strong academic community

Kent's postgraduate students are part of a thriving intellectual community. In addition to lectures, seminars and one-to-one supervisions, our students benefit from a rich and stimulating research culture. We have also invested in Woolf College, a modern facility on the Canterbury campus dedicated to postgraduates, which combines accommodation with academic and social space.

A global outlook

Kent has a great international reputation, attracting academic staff and students from around the world. Our academic schools are engaged in collaborative research with universities worldwide and we offer a range of opportunities to study abroad and an approach that is truly global.

The Graduate School

As a postgraduate student, you also have the support of the Graduate School, which promotes your academic interests, co-ordinates the Researcher Development Programme and the Global Skills Award and facilitates cross-disciplinary interaction and social networking.

Funding

Kent provides a variety of financial support opportunities for postgraduate students. These range from research studentships, location-specific funding, sport and music scholarships, and funding specifically for overseas fee-paying students. For further information, see www.kent.ac.uk/pgfunding

Enhanced career prospects

At Kent, we want you to be in a good position to face the demands of a tough economic environment. During your studies, you acquire a high level of academic knowledge and specialist practical skills. We also help you to develop key transferable skills that are essential within the competitive world of work.

Location
Canterbury

Faculty
Faculty of Sciences

School
School of Engineering and Digital Arts

Contact
School of Engineering and Digital Arts, Jennison Building, University of Kent, Canterbury, Kent, CT2 7NT, UK

T: +44 (0)1227 827323
E: eda-admissions-pg@kent.ac.uk

Applications
Online at www.kent.ac.uk/courses/postgrad/apply

Further information

For information about applying to Kent, or to order a copy of the *Graduate Prospectus*, please contact:
Information, Recruitment and Admissions Office, The Registry, University of Kent, Canterbury, Kent CT2 7NZ, UK
T: +44 (0)1227 827272
F: +44 (0)1227 827077
E: information@kent.ac.uk

The University also holds Open Days and postgraduate recruitment events throughout the year. Please see www.kent.ac.uk/opendays

DPC 115379 08/13 PUB415

COME AND VISIT US

We hold Open Days and postgraduate events throughout the year.

For more information, see: www.kent.ac.uk/opendays

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