UNIVERSITY OF BATH
Department of Electronic and Engineering

Lecturer/Senior Lecturer/Reader in Electronic and Electrical Engineering

Background Information

The University of Bath

The University, which received its Charter in 1966, is situated on a campus of 200 acres, surrounded by open countryside one and a half miles from the centre of Bath. Communications are rapid and easy, with London being less than one and a half hours away by train. The University is structured around 15 Departments which are organised into three Faculties; the Department of Electronic and Electrical Engineering is in the Faculty of Engineering and Design. The University has around 16,000 students and competition for places is keen, resulting in a high quality intake. Research at the University is similarly highly regarded internationally and the University of Bath is ranked in the top 200 in the world in the latest Leiden Ranking and QS World University Rankings. Nationally, Bath ranks highly in many of the newspaper league tables, see http://www.bath.ac.uk/corporate-information/rankings-and-reputation/. The University has many world-class sporting facilities and is the UK's top sports university in The Times & The Sunday Times Good University Guide 2018.

The Department of Electronic and Electrical Engineering

The Department has a long history of education and research and was the first department in the UK to introduce the now-standard MEng degree. There are currently about 630 undergraduate students, approximately 100 MSc students, over 80 research students and staff, and around 30 academic staff. Electronic and Electrical Engineering at Bath is consistently ranked highly in the national league tables and performs very strongly in the National Student Survey, for example it was ranked 4th in the UK in the NSS 2017. The Department is located in Building 2 East, at the centre of Bath's attractive campus. 2 East houses well equipped undergraduate teaching laboratories, computer rooms and research laboratories. Additional research laboratories, including clean room facilities, are located elsewhere on campus. Over the 2015/16 academic year a £350k investment was used to create new student project activity spaces, including PCB flow lines and rapid prototyping facilities. Further laboratory refurbishments are ongoing, as part of an ongoing investment in infrastructure. The teaching and research laboratories are supported by a Technical Manager, with a further six technicians working across all the laboratories.

The Department offers six undergraduate programmes,

- Electrical and Electronic Engineering
- Computer Systems Engineering
- Electrical Power Engineering
- Electronic Engineering with Space Science and Technology
- Electronic Systems Engineering
- Integrated Mechanical and Electrical Engineering

The first five programmes are available as MEng/BEng while the sixth is a joint programme with the Department of Mechanical Engineering and runs as MEng only. The annual undergraduate intake is about 125 students across all programmes and the standard is high, with current offer being AAA for MEng programmes and AAB for BEng. Further details on the structure and content of the programmes can be found at:
http://www.bath.ac.uk/catalogues/2017-2018/ee/ee-proglist-ug.html.

A new MEng Robotics Engineering has recently been approved and will have its first intake in 2018, see http://www.bath.ac.uk/courses/undergraduate-2018/electronic-and-electrical-engineering/meng-robotics-engineering/ for programme details.

In addition to the undergraduate courses, the Department offers the following postgraduate programmes:

- MSc Electrical Power Systems
- MSc Mechatronics (joint with the Department of Mechanical Engineering)
- MSc Electronic Systems Design
- MSc Robotics and Autonomous Systems (new programme with first intake in 2018)
- MPhil/PhD by research

Several of the programmes in our MSc portfolio have been recently developed, in line with the University's increased focus on postgraduate education.

Research in the Department is divided into three research centres:

- Centre for Advanced Sensor Technology (CAST)
- Centre for Space, Atmospheric and Oceanic Science (CSAOS)
- Centre for Sustainable Power Distribution (CSPD)

91% of our research activity was graded as either world-leading or internationally excellent in the Research Excellence Framework 2014 and we have been awarded in excess of £14 million of external funding over the last five years. Research in the Centres can be further divided in to the below Research Themes (Theme Champions indicated in *italics*) and further information on the research of individual staff members can be found at: http://www.bath.ac.uk/elec-eng/people/.

III-Nitride based materials and devices

Dr Duncan Allsopp, Dr Matthew Cole, Dr Ali Mohammadi, Dr Philip Shields (CAST)

We develop wide bandgap semiconductors materials, nanostructures and devices, MEMS/NEMS and vacuum nano-electronics. Our research includes applications of Gallium Nitride based nanostructures in lighting, nonlinear optics and quantum technologies, as well as novel MEMS/NEMS applications and chemical vapour deposition methods of carbon nano-tubes, graphene and 2D materials. Our facilities include wafer-scale nano-imprinting techniques, epitaxy and CVD growth reactors, world-class nanofabrication clean rooms, and advanced materials and device characterisation equipment. Several of these staff are also members of the Centre for Nanoscience and Nanotechnology.

Applied superconductivity

Dr Xiaoze Pei, *Dr Weijia Yuan*, Dr Min Zhang (CSPD)

Our research focuses on issues associated with electrical applications of high temperature superconductors. Research is conducted into energy storage, transmission cables, high power machines and fault current limiters. In particular, we are working with leading international manufacturers to push the boundary of electrical aircraft. These are major areas for future collaboration at both Department and University level.

Biosensors and bioelectronics

Dr Christopher Clarke, *Dr Pedro Estrela*, Dr Benjamin Metcalfe, Dr Despina Moschou, Dr Paulo Rocha, Prof John Taylor (CAST)

Our research focuses on the development of electrical, electrochemical and optoelectronic biosensors and chemical sensors for biomedical, environmental and defence applications. We develop electronics for biosensor device integration, biosensor arrays, bio-inspired systems, biomedical instrumentation and neuron recording. We have strong collaborations in place with end users (clinical and industry) and researchers from a range of disciplines (e.g. chemistry, biology, pharmacology).

Imaging systems

Dr Adrian Evans, Prof Cathryn Mitchell, Dr Stephen Pennock, *Dr Manuchehr Soleimani* (CAST and CSAOS)

We study imaging systems over a range of scientific fields, including tomographic imaging for industrial processes, space science and medical applications, ground penetrating radar systems, and image processing and classification. We develop state of the art tomography software for these imaging applications as well as tomography sensors and hardware. We work closely with many industrial end-users, national and international research organisations.

Integrated circuit design

Dr Christopher Clarke, Dr Benjamin Metcalfe, Dr Peter Shepherd, *Prof John Taylor*, Prof Peter Wilson (CAST)

We undertake research into Integrated Circuits (IC) across a variety of areas including bio-electronic interface and amplifier circuits, mixed signal sensor interface and data conversion circuits, reconfigurable digital circuit design (FPGA), Silicon Photonic transceivers (SiP), configurable analogue circuits and reliable circuits for extreme environments. We also carry out work on Electronic Design Automation (EDA) tools and methods to support circuit design.

Radio systems and radio science / Remote sensing

Dr Ivan Astin, Dr Biagio Forte, Dr Martin Fullekrug, Prof Cathryn Mitchell, *Prof Nicholas Mitchell*, Dr Robert Watson (CSAOS)

Our research focuses on ground and space based sensors with an emphasis on radio techniques including tomography and data assimilation. Applications areas include the study the Earth's atmosphere, oceans and space environment. We research the effects of the natural environment on the propagation of the radio and acoustic waves used in communication, navigation and remote-sensing systems, such as satellite navigation and timing systems (including GPS).

Smart energy systems and services

Dr Roderick Dunn, Dr Chenghong Gu, Dr Ignacio Hernando Gil, *Prof Furong Li*, Dr Ran Li, Dr Kang Ma, Dr Francis Robinson (CSPD)

Our research is focused on advanced modelling and analyses for energy systems and energy customers to deliver cutting-edge solutions for smart grids, smart markets and smart services. Our research addresses critical technical and commercial challenges to reduce the cost of our low carbon transition, whilst taking advantage of ICT technologies, big data (smart grids and smart meters) and integrated energy systems (electrical, gas, heat and cooling).

Robotics and Autonomous Systems

Many of the Department’s academics are also involved in the emerging multidisciplinary robotics and autonomous systems research undertaken in many departments across the University, including Mechanical Engineering, Computer Science, Psychology, Health and Bath Institute for Mathematical Innovation. Our active research areas include: autonomous platforms, sensor systems, application and field deployment, power electronics and computational intelligence.

General Information for Candidates for Appointment

The academic structure of the University is as follows:

Faculty of Engineering and Design
Architecture and Civil Engineering; Chemical Engineering;
Electronic and Electrical Engineering; Mechanical Engineering

Faculty of Humanities and Social Sciences
Economics; Education; Health; Politics, Languages & International Studies;
Psychology; Social and Policy Sciences.

Faculty of Science
Biology and Biochemistry; Chemistry;
Computer Science; Mathematical Sciences;
Pharmacy and Pharmacology; Physics

School of Management

Several departments have developed their own self-financing centres for research and short courses. The University has an enviable reputation for the standard of its intake, its graduate employment record, its research, and its location in a World Heritage City.

As presently established, the University employs about 2,500 staff, and has an annual turnover of nearly £200 million. Considerable use is made of computerised systems covering many administrative procedures including financial reporting and budgetary control, student records, human resources, and the planning and resourcing processes.

Location and Facilities
The University is based on a fine downland site of about 200 acres at Claverton Down, less than two miles south-east of the city centre. The University has been developed on this site over the last 50 years, so that all the buildings are relatively new and have been designed or refurbished to modern standards. Physical working conditions are generally pleasant, with many buildings commanding attractive views. The facilities on campus include a grocery shop, newsagent, post office and bookshop, and sub-branches of three banks. There is also a medical centre and dental practice, while those with sporting and other social interests will find a variety of clubs and societies open to them. The University has extensively revamped its Creative Arts provision and the English Institute of Sport in the south west is now based at the University in extensive new facilities.

In addition to those buildings used for research, teaching and for administration, there are residential buildings on campus in which almost all first-year students reside. Around five hundred further residential places are located in the city. Full-time members of staff may apply to become resident Tutors within the on- or off-campus residences – further details are available from the Department of Human Resources.

Westwood Nursery, which is on site at Claverton Down, offers competitively priced nursery care for babies and children of staff and students from the age of 6 months until they start school. The nursery is open throughout the year and children may attend on a full or part time basis. Places are, of course, subject to availability and there are long waiting lists for some age groups – you are encouraged to contact the Nursery for up to date information. For children of primary school age the University play-scheme aims to organise provision during some half terms and other holidays.

Appointments in the University are offered subject to the University receiving a satisfactory report on your health from the University Medical Officer. This is normally undertaken on the

basis of a review of a confidential medical questionnaire. Smoking of any kind is prohibited in all University buildings.

The City of Bath is recognised as being architecturally one of the finest in Europe and is a very pleasant place in which to live. The communications network is good. Trains run half-hourly to London and the journey time is about 1 hour 30 minutes. The M4 motorway runs 10 miles north of Bath and provides a convenient road network to London, the Midlands, Wales and South West England.

Further information: please visit our website at www.bath.ac.uk.