

Post Details	
Faculty/Administrative/Service Department:	Faculty of Engineering & Physical Sciences Department of Electronic Engineering Centre for Vision, Speech and Signal Processing
Job Title:	Lecturer (B) in Machine Learning for Healthcare
Job Family & Job Level	Research & Teaching
Responsible to:	Head of Centre for Vision, Speech and Signal Processing
Responsible for:	Research and support staff employed on projects for which the post holder is Principal Investigator, and students on programmes and awards that are the responsibility of the post holder
Job Summary and Purpose	To develop a personal research portfolio in line with the Centre and Faculty research strategy, to teach at undergraduate and postgraduate level, and to participate in Faculty administration.
Main Responsibilities/Activities	
<p>To support the research activities of the Faculty by:</p> <ul style="list-style-type: none"> • Developing the research activities of the Centre and Faculty by sustaining a personal research plan independently and/or in collaboration with others as part of a larger research team. • Contributing to the research activities in the UK DRI Care Research and Technology Centre. • Managing and undertaking research activities in accordance with a specific project plan and supervising and guiding the work of staff and research students on own specialist area. • Developing innovative research proposals (as a self-contained item or as part of a broader programme), identifying sources of funding, submitting funding bids, and gaining positive reviews for these. Planning the research to be undertaken. • Publishing original research in appropriate journals or other media, as appropriate. • Attending appropriate conferences for the purpose of disseminating research results or for personal development. • Sustaining and developing professional expertise and maintaining the requirements for registration with the appropriate body (<i>for academics with clinical links only</i>). <p>To support the teaching objectives of the Faculty by:</p> <ul style="list-style-type: none"> • Developing new teaching methods and designing programme units, and taking responsibility for the quality of programme units. • Planning, delivering and critically reviewing a range of teaching and assessment activities including lectures. • Training and supervising of students (including research students) and acting as a tutor for industrial/professional training year students, according to own area of subject specialism. • Setting/marking programme work, practical sessions, supervisions, fieldwork and examinations according to own area of subject specialism, and providing appropriate feedback to students. • Taking part in activities such as validating and examining in relation to the University's associated institutions. <p>To undertake pastoral care of students</p> <p>Using listening, interpersonal and pastoral care skills to deal with sensitive issues concerning students and provide support. Appreciating the needs of individual students and their circumstances. Acting as personal tutor and giving first line support. Referring students as appropriate to services providing further help.</p>	

To engage in scholarship by:

Continually updating knowledge and understanding in the field or specialism. Extending, transforming and applying knowledge acquired from scholarship to teaching, research and appropriate external activities.

To contribute to the efficient management and administration of the Faculty by:

- Performing such personal administrative duties throughout the Faculty as are recognised by the University as properly within the remit of the work of academic staff, as allocated by the Head of Faculty. Such duties may include Faculty co-ordinating roles, for example, running the process of admissions, examinations or teaching quality assessment.
- Advising, supervising and giving guidance to other staff

Person Specification**The post holder must have:**

- An honours degree or an appropriate and equivalent professional qualification in a relevant subject
- Normally a doctoral degree
- Normally former experience of working as a lecturer
- Evidence of administrative and organisational skills
- Evidence of current research/scholarship at post-doctoral level or equivalent

Relationships and Contacts

The post holder will be a member of such Department and Faculty Committees as may be relevant to their administrative duties, for example Department of Electrical & Electronic Engineering Board of Studies and Examination Board. New appointees will be assigned a senior colleague to guide their development and aid their integration into the Faculty and university. Research priorities will be agreed within the strategic framework of the Centre for Vision, Speech and Signal Processing. Teaching and administrative duties will be allocated by the Head of Department, within the context of the teaching programmes agreed by the Faculty Learning and Teaching Committee or similar body.

Special Requirements

- To be able to participate in residential field work, in the UK or overseas, according to own area of subject specialism.
- The post holder is expected to work outside normal office hours as necessary.

All staff are expected to:

- Positively support equality of opportunity and equity of treatment to colleagues and students in accordance with the University of Surrey Equal Opportunities policy.
- Help maintain a safe working environment by:
 - Attending training in Health and Safety requirements as necessary, both on appointment and as changes in duties and techniques demand
 - Following local codes of safe working practices and the University of Surrey Health and Safety Policy
- Undertake such other duties within the scope of the post as may be requested by your Manager.

Addendum

This document provides additional information relating to both specific aspects of the post/faculty and any post specific person specification criteria. The information contained within this document should always be read in conjunction with the accompanying generic Role Profile.

Job Title:	Lecturer in Machine Learning for Healthcare
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Job Summary/Purpose

The appointee will be expected to make a contribution to research and leadership in the Centre for Vision, Speech and Signal Processing related to Machine Learning for applications in Medicine and Healthcare. The post is jointly supported by the UK DRI Care Research and Technology Centre a joint programme between Imperial College and the University of Surrey. The appointee is expected to contribute research and leadership to the CRTC towards improved healthcare for people living with dementia. The appointee will teach in the Department of Electrical & Electronic Engineering at both undergraduate and postgraduate level in both his/her specialist areas in addition to general contribution with the Department programmes.

Background Information

Faculty:

The University of Surrey is organised into three Faculties. The Faculty of Engineering and Physical Sciences (FEPS) comprises the Division of Civil, Chemical and Environmental Engineering, the Division of Mechanical, Medical and Aerospace Engineering, and the Departments of Electrical & Electronic Engineering, Computing, Mathematics and Physics. The Faculty is built on the core engineering disciplines of aeronautical engineering, civil engineering, chemical engineering, electronic engineering and mechanical engineering, together with the core scientific disciplines of computing, mathematics and physics. Within these fields we enjoy a reputation for excellence in research and teaching, allied to a strong enterprise culture and an unrivalled record of graduate employment. Our members of academic staff are well respected, both nationally and internationally, amongst the many areas of academia and industry that we interact with. We believe strongly in the principle that a university should contribute to the cultural wealth of society by developing the basic sciences, whilst also developing the technology which will improve our overall quality of life.

Department of Electronic Engineering:

The Department of Electronic Engineering at Surrey is one of the strongest single discipline entities in the UK. Its research is managed through four research centres comprising the **Advanced Technology Institute** focusing on device materials research and nanotechnology, the **Surrey Space Centre** internationally famous for its pioneering efforts in micro/nano satellite engineering, **Centre for Vision, Speech and Signal Processing** conducting internationally leading research in multimedia signal processing and machine perception, and the **Institute for Communication Systems** leading the UK innovation in mobile and satellite communications, and home to the 5G Innovation Centre for industry-academic collaboration in future mobile technology. The Department has been ranked in the top-5 peer reviewed assessment of research quality in Electronic Engineering for all cycles since the assessment was introduced, with the 2nd largest proportion of world-leading and internationally excellent research in REF2014. Its pre-eminence in the discipline has much to do with the research Centre specific critical mass groupings encouraged over the last 3 decades. The extent and success of the Departmental research programme is evident from the annual research spend which exceeds £20m, half of which is contributed by grant income.

The Department currently has 50 academic staff and more than 650 students who are studying on a range of programmes from BEng/MEng, through MSc, to PhD. All undergraduate and MSc programmes have been accredited by IET for five years. Our undergraduate students benefit from being able to take Surrey's Professional Placement Training Year. The successful professional placement scheme is now being extended to a new type of postgraduate taught programme, EuroMaster, which runs over 2 years and, apart from a major 90 credit project, includes training in business studies and management. The Department enjoys a high annual NSS score. Our teaching and research activities are supported by a range of well-equipped laboratories and computing facilities. Its academic activities are steered by the Departmental Industrial Advisory Board. Recently the Department was bestowed **Regius Chair in Electronic Engineering** for its truly outstanding academic performance over many years, and was awarded,

by the European Association of Electronic Industries, the 2013 Elektra “Department of the Year” Prize for its recent accolades which include a £35m Government/industry grant for research and innovation in 5G communications.

Centre for Vision, Speech and Signal Processing (CVSSP):

CVSSP is one of the largest European research activities in audio-visual signal processing and computer vision. The centre currently has 20 academic staff together with 40 post-doctoral researchers, 85 PhD students and 10-15 visitors. The centre established in 1986, is internationally recognised for pioneering research in computer vision, pattern recognition and signal processing leading to successful technology transfer with UK industry. CVSSP is one of four research centres in the Department of Electronic Engineering. The Centre is internationally leading in pattern recognition, with many of the design methodologies contributed by its staff routinely used worldwide. Research in biometrics carried out since 1995 has achieved significant performance improvement in automatic face recognition resulting in successful commercial exploitation of IP by University spin-out company OmniPerception. CVSSP has pioneered fundamental advances in the 3D reconstruction of complex real-world dynamic scenes from video leading to a number of technological breakthroughs: the first hand-held 3D scanner developed by Hilton and Illingworth was awarded an EU ICT Grand Prize for Innovation and voted in 2006 among the top 50 UK University discoveries in the last 50 years. The curvature shape descriptor developed at Surrey was adopted as international standard. The Centre developed the first systems for capturing 3D models of people; and 3D video technology enabling stereo and 3D production in the creative industries, exploited by the BBC for sports TV broadcasts and The Foundry in their film post-production software used in major Hollywood 3D film productions. Spinout company Imagineer Systems exploited technology for image matting and tracking in movie production receiving a Technical Academy Award in 2013. Research in secure speech communication over mobile networks has been exploited by spinout company MulSys and is widely used by government agencies, banking, and private business. CVSSP has a current grant portfolio of £24M funding from EPSRC, EU, InnovateUK, charity and industry. Importance of CVSSP research is recognised by two flagship EPSRC programme grant awards in audio-visual signal processing and facial recognition with total funding of £13M. CVSSP is a lead partner in the BBC Audio Research Partnership and has received numerous awards including Manufacturing Industry Achievement Award, Biometrics Industry Achievement Award, the RCUK ICT Pioneer Award, Royal Society Wolfson Research Merit Award, KS Fu Prize and IET Faraday Medal.

Main Responsibilities/Activities

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- Contribute to research and teaching activities of the Centre for Vision, Speech and Signal Processing in the Department of Electronic Engineering.
 - Develop a research portfolio in the area of machine learning and healthcare.
 - Contribute to the research of the UK DRI Care Research and Technology Centre.
 - Exploit opportunities to build novel interdisciplinary research activities across the Department/Faculty and University.
 - Publish high quality research findings in appropriate journals or other media.
 - As appropriate, collaborate closely with colleagues in developing facilities, research and teaching.
 - Recruit and supervise postgraduate research students.

Person Specification

- A thorough background in machine learning and its application in healthcare.
- A strong research and publication record.
- Experience in developing research proposals and securing research income together with supervising postgraduate research students.
- Familiarity with development, delivery and assessment of programme units.

- Experience of working with industry and other professional bodies.
- Excellent presentation, communication and interpersonal skills.

Relationships and Contacts

The appointee will report to the Head of Research Centre and Head of Department of Electronic Engineering, as appropriate. S/he will establish working relationships with staff (including other academics, researchers, technicians and support staff) and students in the Centre in addition to staff in the wider Department, Faculty and University, as appropriate. S/he will liaise with sponsors and external bodies informally and formally, as necessary.

UK DRI Care Research and Technology Centre - Overview

This lectureship post will be associated with the UKDRI Care Research Technology Centre a joint research programme between Imperial University and the University of Surrey. This post will contribute to the activities of the UKDRI CRTC and contribute to the P4: Improving Sleep and Circadian Rhythm and P6: Healthy Home sub-programmes led by University of Surrey.

The UKDR Care Research and Technology Centre will develop new ways to help people live well with dementia. We have an ageing population, limited resources for home care and no immediate cures available. All too often patients are isolated and develop preventable problems leading to unnecessary hospital admissions. New technologies hold great promise for providing solutions. We work to focus the best minds on developing new ways of caring for people with dementia through advanced technologies. Our goal is to bring together a diverse team of doctors, engineers and scientists who together can harness recent advances in artificial intelligence, engineering, robotics and sleep science to create novel technologies that will deliver highest quality dementia care in the home.

Our work within the UKDR Care Research and Technology Centre is guided at all stages by patients and their carers, focusing on issues that are most problematic. We will work to find new ways to keep people independent in their homes, improve general health and sleep, and reduce confusion and agitation. We use a range of unobtrusive devices that, when placed in the home, allow behaviour and health to be monitored. By harnessing the power artificial intelligence, we will then be able learn an individual's behaviour and predict when problems might arise. We will develop new ways to identify medical complications in the home when they are in their earliest stages. For example, new genetic methods allow infections to be diagnosed early and then rapidly treated in the home.

The Healthy Home programme within the centre will develop solutions to monitor for other risks to well-being. We will work out how best to prompt patients to resolve problems, and also develop smart solutions that allow continuous interaction with patients. The work we propose is centred on the needs of the patient and their carers. This will personalise our medical approach, tailoring care to an individual's needs. By measuring real behaviour in the home, rather than clinical measures in the hospital, our work will provide a new way to assess dementia that should dramatically improve the assessment of new treatments. UKDRI CRTC that joins activities at Imperial and Surrey aims to rapidly develop new technologies to transform dementia care.

With colleagues in the Imperial College London, we will optimise these technologies in a model home environment, deploy them in real-world evaluation studies and then, with an evidence base, deliver them to people with dementia and their carers.

Our Healthy Home programme will focus on developing reliable, safe and secure artificial intelligence systems and adaptive machine learning algorithms that improve health autonomy by predicting clinical events, supporting activities of daily living and facilitating communication between patients, carers and health professionals; integrating devices that monitor and manage the environment for improved safety and patient quality of life.

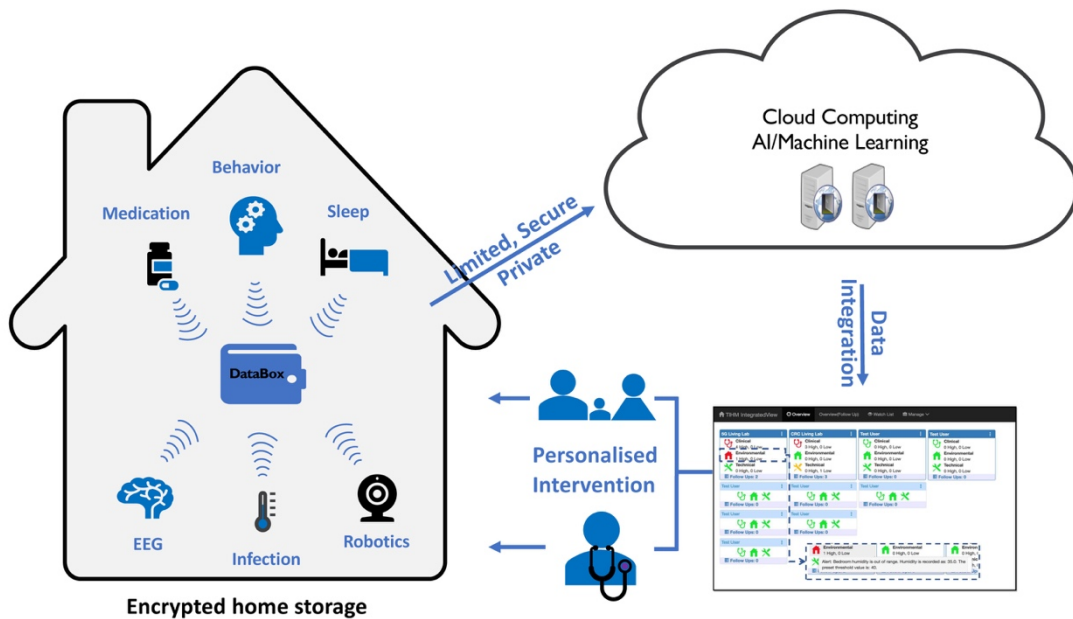


Figure 1: The Healthy Home system will use a range of biosensors to collect environmental, physiological and behavioural data in unprecedented detail.

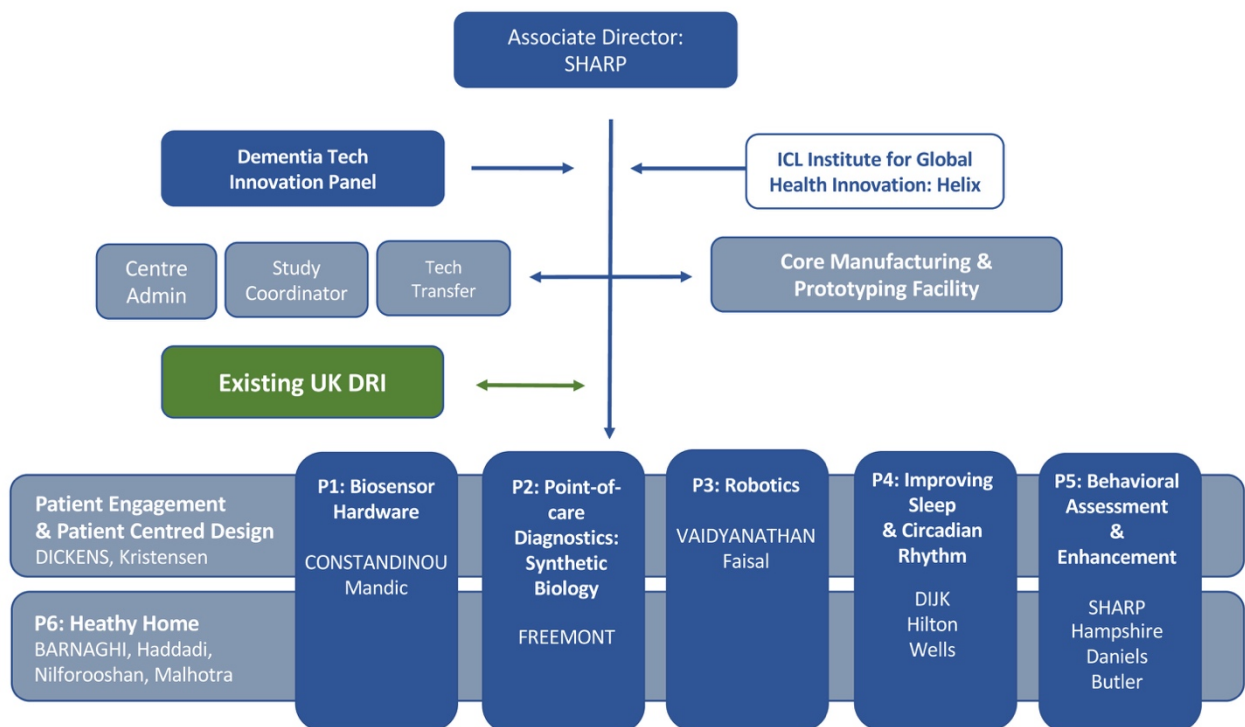


Figure 2: Centre organisation.

Further Information: <https://www.imperial.ac.uk/uk-dri-care-research-technology>