University of Reading

Professor / Associate Professor / Lecturer
Department of Computer Science

Further Particulars

THE OPPORTUNITY – A NEW DEPARTMENT

The University of Reading has opened a new dedicated and focused Department of Computer Science in 2016. Our aim is to create a highly successful teaching and research department as a component within the School of Mathematical, Physical and Computational Sciences (SMPCS) by building upon existing expertise and programmes in Computer Science and capitalising on the opportunities for interdisciplinary working across the School. SMPCS is already a major centre within the University for world-leading research excellence and high-quality teaching and learning and the arrival of the Department of Computer Science in the School presents many exciting opportunities.

The University has a longstanding track record of teaching leadership and innovation in this discipline with existing successful BSc Computer Science and MSc Advanced Computer Science (Big Data Analytics) programmes. It is expected that new programmes aligned with research priorities will soon be developed, contributing strongly to global demand for graduates with the skills necessary to manage and manipulate the ever-increasing volume, variety and velocity of data produced daily across the world.

The Department intends to establish strong computer science research activity in two main areas: Data Science and Computational Science; and by so doing enhance research across the University, especially in relation to the Environment research theme. SMPCS is a major contributor to this theme, through the research conducted in its Departments of Meteorology and Mathematics & Statistics, doctoral training centres funded by NERC and EPSRC, long-standing relationships with the Met Office, the European Centre for Medium Range Weather Forecasts (ECMWF), and NERC Centres, and its close engagement with the Institute for Environmental Analytics. The Department of Computer Science has significant opportunities to leverage these existing strengths, and the environment and infrastructure across the School, as it builds its own programme of world class research.

THE POSTS

We are seeking to appoint up to five permanent academic positions to build expertise in our priority research areas of Data Science and Computational Science and contribute to the development of the Department's teaching activity. We intend to appoint across the range of junior and senior levels: Lecturer (broadly equivalent to Assistant Professor), Associate Professor and Professor; and are planning further expansion of the department in the near future.

We are seeking staff with strong track records of research excellence and/or strong leadership skills and experience in both research and teaching, appropriate to the seniority level. This should include internationally excellent or world-leading academic publications, ideally coupled with demonstrable impact, a portfolio of research funding and successful doctoral supervision experience appropriate to career stage, combined with significant and demonstrable leadership experience for Professorial posts.

Applications are particularly welcome from academics whose research interests and expertise are aligned with the intention to develop world-class research in Data Science and Computational Science, and have the experience and ability to enhance research in the School and University, especially in

relation to the Environment research theme. The ability to engage across the University in our other research themes (namely Health, Food, Heritage & Creativity and Prosperity & Resilience) would also be advantageous.

The new department will deliver and grow the existing broad-based, high quality BSc in Computer Science and the MSc in Advanced Computer Science, which is focusing on Big Data Analytics. We plan to develop our BSc and MSc programmes to reflect the research expertise of the department as it grows. For this reason, we are seeking staff who can provide excellent teaching aligned with individual research strengths while also ensuring necessary subject coverage to maintain BCS accreditation and further enhance the employability of our graduates.

All staff in the School are expected to contribute to its administration, and senior staff are expected to provide leadership in this regard. Departmental administrative roles are assigned via expressions of interest and by agreement with the Head of School and/or Department. We would particularly welcome applications from senior staff willing to engage in providing significant research and/or administrative leadership in the department.

RESEARCH

Our vision is that the Department of Computer Science will become a leading research centre in focused areas of computer science, building on existing strengths and leveraging the research capability and critical mass within SMPCS. It is important to note that significant research activity in the existing School falls in areas adjacent to computer science.

The Department will play a key role in applying its research expertise in collaborations and application areas across the University and externally to create societal and commercial impact from its work. A vital component will be building on existing strong industrial engagements, in both teaching and research, and forging new relationships, particularly within the Thames Valley.

To support the University's Environment Research Theme, and gain critical mass from engaging collaboratively with the scientific challenges across the School, there will be a particular focus on developing interdisciplinary activity and collaborative projects with the wider School. These activities include two research-council-funded doctoral training centres, strong relationships with the Met Office and ECMWF, and we are host to large parts of two NERC national centres, the National Centre for Atmospheric Science (NCAS) and the National Centre for Earth Observation (NCEO) already hosted within the School. The new department will also benefit from close working relationships with the Institute for Environmental Analytics (recently established as a spin-off venture from the School) that provides a meaningful link between science and industry in the translation of environmental data into industrial and societal impact.

We envisage a particular emphasis in the first phase of development on enhancing research strength in two broad areas, as follows.

Data Science - There is a growing imbalance between society's ability to generate data and the concomitant ability to exploit it. There are two critical aspects: data analytics algorithms and data systems at scale (software and hardware infrastructures suitable for peta and exascale data, on clusters and/or clouds). Research on Machine Learning, Data Mining and Big Data Analytics is devoted to algorithms, techniques and applications for data-driven knowledge discovery from large amounts of data. Algorithms cover a range of predictive and descriptive methods, such as clustering, classification, subgraph mining, Bayesian inference, artificial neural networks, association rules, etc. Application domains include life sciences, neuroscience, climate science, and industrial and business sectors.

Computational Science - Large-scale environmental simulations require ever more sophisticated and complex computational models, coupling different physics on multiple time and space scales, and demanding the largest high performance computing resources. A huge enabler and driver for the

development of these models is increases in computer power moving towards exascale computing, and associated trends towards shared memory cluster nodes with an ever increasing number of cores, stagnant or decreasing clock frequency, and decreasing memory per core. Our main focus is on the development of the methods, algorithms, and implementations to exploit emerging computer architectures for scientific computing.

The Department of Computer Science is expected to develop expertise largely complementary to existing skills within the School to work closely with groups in both the Department of Meteorology and the Department of Mathematics & Statistics with strengths in data assimilation, numerical weather prediction, computational fluid dynamics, high-resolution HPC modelling, space weather simulation, and numerical analysis and scientific computing. In doing so, it will benefit from existing strong links between the School and external partners, including the Met Office, ECMWF and other weather and climate research and operational centres together with industrial partners in a range of sectors. It will also work closely with our EPSRC-funded Centre for Doctoral Training in Mathematics of Planet Earth and NERC-funded SCENARIO Doctoral Training Partnership.

TEACHING AND LEARNING

The teaching aims of the Department of Computer Science are to provide an excellent education in modern computer science with a particular emphasis on the needs of employers, covering areas such as programming, software design, computer systems, operations and data science. Based in the heart of the UK's 'Silicon Valley' we have excellent links with local employers, which include many of the world's foremost technology and IT companies. Our strong engagement with industry helps shape the content of our degree programmes and provides opportunities for the industrial placements incorporated into the four-year "with Industrial Year" variant of our degree. Graduate employability is excellent, with the 2015 Times Good University Guide ranking Computer Science 12th in the UK for Graduate Prospects.

For 2016/17 our portfolio of programmes in the department is

- BSc Computer Science
- BSc Computer Science with Industrial Year
- MSc Advanced Computer Science

and we intend to develop this portfolio with new specific programmes in Data Science.

Currently, the two undergraduate Computer Science programmes have approximately 350 registered students and have shown healthy growth over the last two years. The masters programme is in its second year of operation and has a strong cohort of 10-15 students per year.

It is a key priority of the department to deliver an attractive range of modules which employ a number of modern learning techniques, and we have expertise in technology-enabled and technology-enhanced learning. In addition to this, the Computer Science operates two successful MOOCs on the FutureLearn platform, which have had in excess of 200,000 registered learners.

STAFF

Currently the department consists of 15 academic staff members in both, teaching-and-research and teaching-intensive positions (http://www.reading.ac.uk/computer-science/dcs-meet-the-team.aspx).

Considering the continued successful recruitment of students over the last few years, it is expected a further growth of the department in the near future.

THE WIDER SCHOOL

With over 350 staff (including over 100 core academic staff and 120 research staff), the School of Mathematical, Physical and Computational Sciences (SMPCS) is one of the largest Schools within the University of Reading, and one of the largest and most successful Schools of its kind in the UK.

The School is currently comprised of the Department of Mathematics & Statistics, the Department of Computer Science and the Department of Meteorology, with much joint activity across these departments, including five joint appointments, one at Chair level. The School is proud to host important national activity in the atmospheric and earth sciences, including large parts of NERC NCAS and NERC NCEO, which add hugely to research activity and environmental specialisms across the departments. We are also host to the Statistical Services Centre, a commercial consultancy and training unit working with a global client base and integrated into the teaching of statistics across the School, and Counting Lab, a successful spin-off company from Mathematics & Statistics. We currently host and lead the University's Walker Institute for Climate System Research, which is at the forefront of the science of climate change and its implications for future human society. A huge and distinctive asset to the School is that we are also home to approximately 25 Met Office scientists, embedded into our research activities.

This large activity is supported by significant investment by research funders and other partners. Over the last three years staff in the School have been awarded circa £45m of competitively won research grants and contracts, which support our large research community together with over 110 PhD students. Reflecting our very strong industrial and commercial links, several appointments at professorial level are funded by the Met Office and business/industrial partners, In commemoration of Her Majesty The Queen's Diamond Jubilee in 2013, the first Regius Professor in Science in the UK was appointed to the School (Professor Keith Shine, FRS), one of just 12 Regius Professorships created across all subject areas across the UK.

Our research strengths were reflected in our strong performance in the 2014 Research Excellence Framework (REF2014) exercise. Within the Earth Systems and Environmental Sciences Unit of Assessment (which included work from the Departments of Meteorology, Mathematics & Statistics, and Geography & Environmental Science as well as staff employed by the Met Office), 86% of our research was rated World Class or Internationally Excellent. Research in this area is centred on the general theme of understanding environmental systems in the past, the present and the future. Knowledge gained is used to inform policy in environmental management and sustainable development, and to develop adaptation and mitigation strategies in response to environmental change. In this Unit of Assessment, we were ranked third in the UK by Research Power, with 51% of our impact submissions rated 'outstanding' (4*), and fifth in the UK by Research Intensity. Reflecting this research reputation, our staff are embedded in decision-making and leadership roles across the academic community and beyond, for example on the Councils of the Royal Statistical Society, the Royal Meteorological Society, the Joint Mathematical Council, the Institute of Mathematics and its Applications, the Institute of Physics, the UK Government Climate Change Committee, and the Board of the Met Office. Our staff Chair the European Space Agency Earth Science Advisory Committee, and head up a large part of NERC NCEO, the British Atmospheric Data Centre and the Computational Modelling Services and Climate arms of NERC NCAS.

THE UNIVERSITY OF READING

In 2016 the University of Reading celebrates the 90th anniversary of the granting of our Royal Charter in March 1926, and today is in the top 1% of universities in the world with a world class reputation for teaching, research and enterprise. We were the first university to win the Queen's Award for Export Achievement, and have received the Queen's Anniversary Prize for Higher Education three times in 12 years.

The quality and diversity of research at Reading is recognised nationally and internationally, and the University is home to several centres of excellence, conducting world-class research across a broad range of disciplines. The 2014 Research Excellence Framework (REF2014) exercise confirmed our place as a world-leading research-intensive university, with 98% of our research 'internationally recognised', 78% classed as 'internationally excellent' and 27% as 'world leading'. REF2014 placed the University 19th in the UK by research intensity (a measure of quality adjusted by the proportion of researchers submitted), and 27th in the UK by research power (out of 154 submitted institutions). Research power recognises both the quality and quantity of research submitted into the exercise. In addition to our excellent performance in Earth Systems & Environmental Sciences, strong results were also obtained by Agriculture, Veterinary & Food Science (ranked fourth in UK by research power), Architecture, Built Environment and Planning (ranked sixth in UK by research power), Typography (ranked first in UK by grade point average) and Classics (ranked third in the UK by grade point average for research outputs).

Our magnificent setting is one of the University's greatest attractions. Our main Whiteknights site is set in 130 hectares of beautiful parkland 3 km from the centre of Reading: this is the heart of the University and provides a special sense of community to both staff and students. Within its green, open spaces, large lake, magnificent rare tree collection and wildlife it is an exceptional environment in which to work and teach.

LIVING AND WORKING IN READING

Reading is the thriving commercial centre of the Thames Valley, located approximately 50 km west of London and in the heart of the UK's 'silicon valley'. Established as a settlement in Saxon times, Reading has been the county town of Berkshire for almost 400 years. Well-situated in the UK's highest-performing economic area, it is surrounded by beautiful countryside and low hills, with outdoor amenities of all descriptions from breezy hilltop and ridgeway walks to quintessential riverside pubs. Other attractions include the Oracle Centre (almost 100 leading-brand shops, bars and restaurants, together with a 12 screen multiplex cinema, all in a lively waterside setting) and over 100 parks and playgrounds throughout the town. The town is also home to the annual Reading Festival, second only to Glastonbury in the UK's music calendar, the Reading Fringe arts festival, and Reading Town Football Club. Together with a wide range of highly-rated private and state schools, it's no surprise that a recent survey placed Earley, the suburb of Reading in which the University's Whiteknights campus is situated, among the Top 5 'most desirable places to live in England'.

Despite its proximity to London, Reading has a net inward commuter flow and is the home of many national and international companies. Within the computer and telecommunications sector, Microsoft and Oracle have multi-building campuses in Reading, alongside other leading players such as Fujitsu, Hewlett-Packard, Cisco, Ericsson, Huawei Technologies, Intel, Nvidia, Silicon Graphics, Agilent Technologies, Sage, Symantec, Verizon Business, Xerox, etc.

Reading is particularly well-connected to transport networks. It is served by three junctions from the M4 motorway, and London's Heathrow Airport is 30 minutes by car or regular shuttlebus services. By rail, a recent $1BN expansion to Reading station offers fast direct rail links to London Paddington (25 minutes) and to Oxford, Manchester, Birmingham, Bristol, Newcastle, Plymouth and Southampton, while the forthcoming extension of the Crossrail link to London will cut journey times even further and link directly into London's integrated transport system.

OTHER INFORMATION

Informal enquiries are encouraged and may be made to the Head of Department

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