Chair in Computer Science
School of Computer Science

Job Summary

The School of Computer Science at University of Birmingham seeks to recruit an outstanding academic to the post of Professor of Computer Science. The School's areas of strengths are in artificial intelligence, cyber-security, human-centred computing, and theory. The School also has strengths in interdisciplinary research with social sciences, the humanities, life sciences and medicine and is therefore keen to support joint appointments with other schools. Applicants must state which of the school's areas of strengths they are interested in. Inter-disciplinary candidates should also state which other discipline is relevant. We are particularly interested in computational neuroscience, biomedical modelling, data science, and the behavioural sciences.

The School

In addition to conducting world leading research, the School of Computer Science teaches about 700 undergraduate students and about 200 postgraduate taught students. It employs 50 permanent academic staff and a number of postdoctoral fellows, teaching fellows and PhD students. The School is recognised for its excellence in cyber-security by GCHQ and for its excellence in Artificial Intelligence by the Alan Turing Institute. It is home to both EPSRC and Royal Society fellowship award holders. It has established partnerships with industry, including with PwC, Hewlett Packard, Samsung, Jaguar Land Rover, and other international companies. It has staff who hold joint and honorary appointments with the likes of Google and with universities in Europe, the USA and China.

Role purpose

To create and disseminate knowledge through initiating and conducting world leading original research, through publication, by seeking external funding, and through developing and delivering undergraduate and postgraduate programmes in computer science. To contribute to the School's senior leadership team and assist in the management and development of an exciting and growing school.

Scope of the role

The post holder is expected to contribute to research, teaching and administration at professorial level.

Research involves initiating, creating and disseminating knowledge. It also involves securing the funding required for research and can involve public engagement, as well as pursuing research applications and societal impact. At Chair level, research is likely to involve an established international reputation and significant academic and/or societal impact.

The role will include a substantial contribution to: (a) the leadership, management, and delivery of teaching with the aim of enhancing student learning; (b) leading a team of other academics, and (c) enhancement of the student experience. The role will typically also involve collaborating with others, including: (a) providing expert advice to staff and students, (b) supervising and examining PhD students, and (c) developing and advising other academics on learning and teaching tasks and methods.

Administration is likely to involve both contributions within the School and contributions to the wider College and University. This may include developing and making substantial contributions to knowledge transfer, enterprise, business engagement, public engagement, widening participation, schools outreach, or similar activities at School level or further within the University. It will is also expected that there is a sustained contribution at University level.

How to apply

Applicants are invited to submit their application online to us, via http://www.bham.ac.uk/staff/jobs. Applicants should submit a cover letter as well as research, teaching and administration statements. (These can be submitted as a single PDF, along with the curriculum vitae.)

For further information, or to discuss the role, please contact: Professor Andrew Howes (Head of School) hos@cs.bham.ac.uk
Salary: Professorial.

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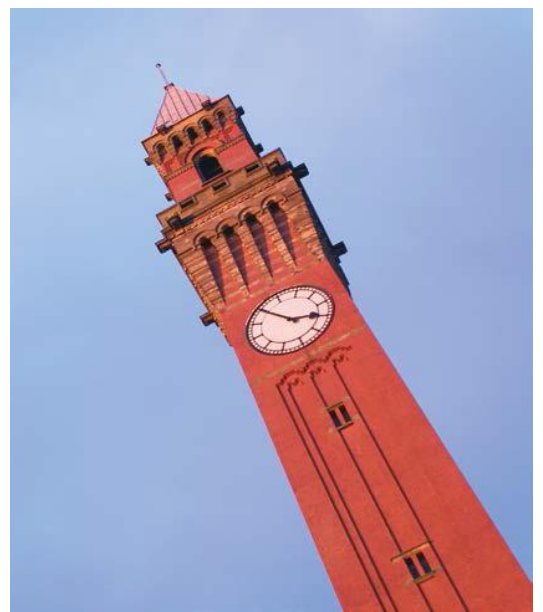
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Responsibilities

- Make a leading contribution the School's research culture and strategic vision,
- Publish high quality world-leading research outputs,
- Actively engage in significant grant capture,
- Show clear leadership in their field and make intellectual connections with other colleagues from across UoB, the UK, and internationally,
- Teach modules (UG and PGT) in the School as directed by the Head of School,
- Actively seek to develop and support junior members of staff, providing informal support and mentoring, for example, around submitting high quality peer-review publications and when leading on high profile research bids,
- Contribute to, develop and review teaching programmes within the School, ensuring these meet relevant standards within the University and external institutions,
- Contribute to the management of the School,
- Serve as required on School, College and University wide bodies.

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Person specification

We would expect the candidate to:
Have an outstanding research record of international stature;
Have the vision, leadership, and enthusiasm to further develop a ground breaking and world leading research agenda;
Hold research funding and demonstrate an established and sustained record of external funding;
Demonstrate an ability to lead and interact with staff and students at all levels, and to contribute to broadening the strategic development of the School;
Show awareness of the importance of, and willingness to play a part in the teaching of undergraduate and graduate students, and supervision of post-doctoral researchers.

Qualifications
- A PhD
- An internationally leading presence in their research field.
- Evidence of having contributed to journal editorship and other community leadership.
- Demonstrated the use of novel teaching and learning methodologies.

Research
- Demonstrate research experience and an exciting and innovative research plan.
- Demonstrate an extensive list of rigorous and impactful publications.
- Evidence of significant research income generation.
- Evidence of leadership in research and the potential to drive forward a research strategy.

Management and Administration

- Demonstrate the ability to lead and mentor a team of researchers and educators,
- Ability to identify new areas of research and teaching,
- Demonstrate networking skills across the university,
- Demonstrate resource planning and management,
- Be able to implement the mission of the School, College and University,
- Be able to solve problems creatively and effectively and demonstrate knowledge of academic quality assurance mechanisms
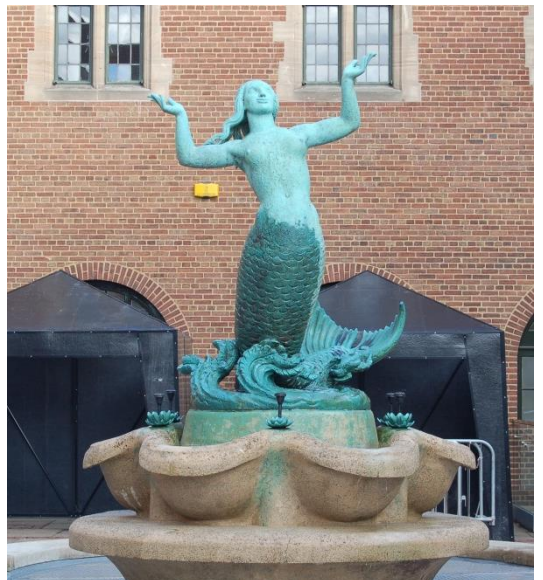
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School of Computer Science

The School's main areas of research are Artificial Intelligence (AI), Cyber security, Human-Centred Computing, and Theory. These are at the intersection of societal need and Birmingham expertise. In addition, the School strongly encourages inter-disciplinary research and has a number of members of staff who work with colleagues in the medical, social and physical sciences. These areas are described below.

Artificial Intelligence (AI) Artificial Intelligence is sometimes thought of as an area of computer science concerned with building computers that perform human-like functions. It has also become associated with the study of the properties and applications of classes of algorithms including reinforcement learning and artificial neural networks. At the University of Birmingham, the Artificial Intelligence group consists of 14 academic staff. Our existing strengths are in computer vision, machine learning, robotics, natural language processing and evolutionary computation. One staff member, Professor Ata Kaban, holds a 5-year EPSRC fellowship in dimension reduction. Professor Tino is involved in an European Commission Innovative Training Network and we have a world-leading computer vision scientist and Turing Institute fellow in Professor Ales Leonardis. Professor Xin Yao is one of a number of leading scientists in Evolutionary Computation and Yao holds a joint appointment with SusTECH in China.

Cyber Security and Privacy.
Cyber security is concerned with how to build computer systems that are resilient to attack by humans or other computer systems. Our research covers all layers from low-level security attacks on keyless entry systems, through more abstract design principles underlying security in general, to strategies for the secure management of processes and people. The work of the group spans from applied aspects of automotive industry through to theoretical aspects of cryptography. It also involves the implementation of cryptographic protocols on hardware. One particular focus for us is on the security of major transport infrastructure including automotive security. Our group is an NCSC-EPSRC *Academic Centre of Excellence* and one of small number of centres of excellence in cyber security in the UK. Led by Professor Mark Ryan, the *HP Chair* in Cyber Security. Professor Garcia has won a 5-year EPSRC fellowship starting in 2018. Another award is for an EPSRC and NCSC *Research Institute in Hardware Security*. Another from the ERC is for Future-TPM (Trusted Platform Module).

Human-centred computing Human-centred computing is concerned with the impact of computing systems on humans and society. It also includes the study of how and why people interact with and through machines (Human-Computer Interaction), the study of how people manage large software projects and systems (Software Engineering) and the study of legal frameworks for the governance of technology, including AI. Professor Yeung (a joint appointment with Law) leads our research effort in 'Responsible AI' and has recently won a Council of Europe commission to report on this issue. A novel focus is on bridging AI/cyber-security and social sciences. Also, engagement activities are planned through the Institute for Coding. Team science is crucial in this and more generally for the future of this group.

Theory The aim of theoretical computer science is to understand the nature of computation and through this understanding provide more robust and efficient programming methods. This group is internationally recognised and it has recently attracted *a Royal Society fellowship holder* (Vicary) and two Birmingham Fellows. The group also works on verification methods. These are formal techniques for checking that systems function correctly. In particular, work is conducted on quantitative verification, which is used to check properties such as safety, reliability, performance and many others. In recent developments the groundwork has been laid for at least four *advanced software tools*, driven by mathematical theory: verification (PRism), distributed computing (game semantics), proof checking (Unimath), and type theory (higher-order categories).

Computational Life and Medical Sciences. The aim of Computational Life and Medical Sciences is to construct computational models of biological and psychological processes from data. These models can be used to help explain biological processes and/or contribute to the diagnosis of disease. In computational neuroscience, they can be used to explain human behaviour. For example, Professor Dehghani is focused on imaging and measurement of physiological information from biological tissue. Dehghani leads a European Commission H2020 funded project that aims to use advanced photonics in the study psychological disorders. The vision is to develop non-invasive tools that provide information about the brains of patients who have experienced traumatic brain injury and about hypoxia in new-born children. Styles is Co-Director of the EPSRC-funded Centres for Doctoral Training PSIBS and Sci-Phy-4-Health and Deputy Director of COMPARE. Shan He is interested in the application of machine learning and optimisation methods to biological and clinical problems. Tino works closely with Wiebke Arlt (Institute of Metabolism and Systems Research). Others work closely with computational neuroscientists in the School of Psychology.

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Staff

Our staff come from various specialist backgrounds in computer science and from many areas of the globe, and we are proud to have a diverse academic community. Find out more here:

http://www.cs.bham.ac.uk/people/

The University is a family-friendly employer and the School of Computer Science welcomes flexible working to suit family or other commitments. The University has on-campus childcare facilities. The School of Computer Science is committed to equality and diversity and an holds Athena SWAN bronze award.

Teaching

Our teaching spans across undergraduate and postgraduate specialisms, and we are proud to offer a varied curriculum to our students. Our undergraduate BSc programmes include:

- BSc Computer Science (also with Year in Industry/Study Abroad)
- MSci Computer Science (an integrated BSc+MSc)
- MEng Computer Science with Software Engineering
- BSc Artificial Intelligence and Computer Science
- BSc Computer Science with Digital Technology Partnership

Our postgraduate taught programmes offer learning in a variety of computing disciplines:

- MSc Computer Science
- MSc Advanced Computer Science
- MSc Robotics
- MSc Human Computer Interaction
- MSc Cyber Security

We also offer two research degrees, and the expanse of expertise in our academic staff allows many topics to be covered:

- MRes Natural Computation
- PhD Computer Science

Our College

The University consists of five academic colleges, and the School of Computer Science is part of the College of Engineering and Physical Sciences.   Our College comprises seven academic Schools working across the frontiers of science and engineering in education, research and translating knowledge. The College's focus is on three core themes of the Science Frontiers, Advanced Manufacturing and Resilience, Energy and Sustainability.   Find out more here:

https://www.birmingham.ac.uk/university/colleges/eps/index.aspx

The University

We have a long and proud history of firsts at the University of Birmingham; we were the first – and are now one of the largest – civic universities in the UK. We were also the first UK University to:

- Be built on a campus model
- Incorporate a Medical School; and
- Welcome women to take medical degrees

More recently we were the first university to establish a fully comprehensive secondary school and when we open our new campus in Dubai this autumn, we will become the first Russell Group and Global Top 100 university to do so.

Our heritage as the original 'redbrick' is combined with one of the most compelling and ambitious agendas in higher education. Quite simply, at Birmingham we make things happen. Birmingham is a leading member of the Russell Group and a founder member of the Universitas 21 global network of research universities.

Home to world-class researchers, we count 11 Nobel Laureates among our staff and alumni, including three prizes awarded in 2016 for Physics and Chemistry. We have been integral to some of the greatest scientific discoveries of recent times, such as the Higgs bosun and gravitational waves, and are pioneering new approaches to tackling some of the biggest global challenges facing society; from antibiotic resistance and maternal health to conflict resolution and access to education.

With more than 7,500 staff, 34,000 students and 300,000 alumni across the globe, we think, recruit and compete worldwide. Ranked in the top 100 universities globally and the top 20 in all domestic league tables, the quality of what we do at Birmingham is widely recognised. We were awarded Gold in the 2017 Teaching Excellence Framework and in the most recent Research Excellence Framework (REF2014), more than 80 per cent of our research was rated as internationally excellent or world-leading.

In 2014 *The Times* and *The Sunday Times* named us **University of the Year** in recognition of our bold, ambitious strategy and innovative approach to the challenges facing the sector. In 2016 they named us **University of the Year for Graduate Employment** – recognising our sector-leading employability programmes and outstanding rates of graduate employment. Thinking differently is in our DNA. Led by our Vice-Chancellor, Professor Sir David Eastwood, the University is structured for swift decision-making, enabling us to capitalise on our academic range and financial strength as well as the opportunities that emerge in the fast-changing global HE environment. Many of our initiatives, such as our 'Birmingham Fellows' programme, which has so far seen over 70 of the world's best early-career academics join us, our widening participation activities, and our unconditional offers strategy for exceptional students, have been much emulated within the sector.
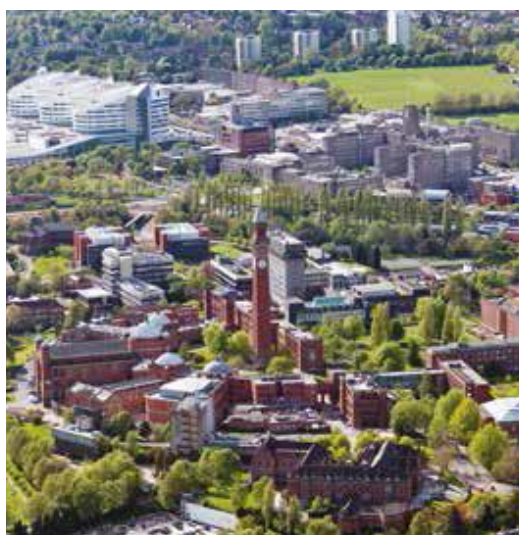
The city of Birmingham

The city of Birmingham has undergone a major transformation in the last decade and regularly features as top place to visit – in fact, it was the only place in the UK listed in the Rough Guide's Top 10 places in the world to visit in 2015. In a recent Sunday Times/Zoopla report 'Best Places to live in Britain' three areas of Birmingham all made the top 50 best places to live in Britain, with the suburb of Moseley being voted the overall winner.

A city of historical interest and contemporary vision, Birmingham has a rich and diverse community that creates a vibrant, multicultural and exciting place to live and work.

The city is home to the internationally renowned Birmingham Royal Ballet and one of the world's greatest concert venues: Symphony Hall. The City Museum and Art Gallery houses the world's finest collection of Pre-Raphaelite paintings, alongside a major collection of Old Masters, Modern and Contemporary pictures, while the iconic Bullring is one of the largest dedicated shopping facilities in Europe. Sports and recreation are also well served; the city offers international Test cricket, high-level football, international championship golf and tennis, and top-class rugby. As a multicultural city, Birmingham is also renowned for the breadth of its cuisine and has more Michelin-starred restaurants than any other English city outside London.

Birmingham is within an hour's drive of Stratford-upon-Avon and the Cotswolds. From Birmingham Airport, more than 50 different airlines operate scheduled services to 100 destinations worldwide. The University has its own dedicated railway station, while 50 million passengers a year use Birmingham New Street Station, and the city will be a major hub for the high-speed rail network. London is 80 minutes away by shuttle service, with trains every 20 minutes.