

## Chair in Cognitive Robotics

Job reference: 38193  
Closing date: 30 March 2010

### Job outline

- Full time – Permanent
- Open to Internal and External Candidates
- Grade 10 – Salary will be commensurate with seniority of the role and negotiated with the Vice-Chancellor
- Terms and conditions – Academic Teaching Staff (non-clinical)

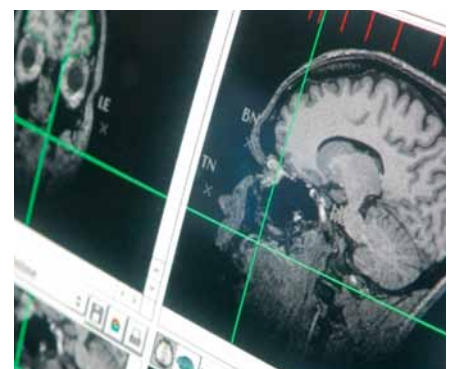
### Job summary

The University of Birmingham is investing in a Centre for Computational Neuroscience and Cognitive Robotics (CN-CR). This investment is primarily in ten permanent posts, seven in Neuroscience and three in Robotics. These comprise three chair appointments, four lectureships and three technicians. The chair in Cognitive Robotics will be expected with the other chairs appointed to lead the centre, establishing it as the leading international centre in this interdisciplinary area. In addition the Chair in Cognitive Robotics will be expected to lead the existing Intelligent Robotics Laboratory in the School of Computer Science in collaboration with existing members of the group. The appointee will be expected to grow this group significantly, obtaining external research funding, and publishing work of the highest academic quality and impact. The appointee will also be expected to contribute to teaching of a proposed joint postgraduate programme in Computational Neuroscience and Cognitive Robotics, as well as to the delivery and management of postgraduate and/or undergraduate teaching in the School of Computer Science.

### The person

The successful candidate will have not only an outstanding international reputation and a track record of internationally leading research (evidenced for example by a track record of high impact journal publications and invitations to give keynote talks at leading conferences), but also a clear research vision, with a strong interdisciplinary component. The appointee will also have an outstanding track record in attracting external research funding, especially for interdisciplinary work, excellent leadership and management skills, and the ability to attract and inspire researchers of the highest calibre. He or she will be an inspiring teacher, able to communicate with researchers, undergraduates and the general public. Finally they will be willing to contribute to management of CN-CR, and the School of Computer Science generally.

No specific area of expertise within the scope of CN-CR has preference. Applicants will be welcomed with interests in areas such as motor control and motor learning, computational vision, robot learning, developmental robotics, cognitive architectures, rehabilitative robotics, and assistive robotics. The key requirement is a willingness and ability to engage in and lead the interdisciplinary work of the centre.



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## Main responsibilities

- With appointees in Computational Neuroscience and existing staff to help lead the development of a novel interdisciplinary research programme in CN-CR linking work in robotics with that in Computational Neuroscience and with existing research groups in the Schools of Psychology, Biosciences (particularly Animal Cognition); Sport and Exercise Science; Electrical, Electronic and Computer Engineering; Manufacturing and Mechanical Engineering, and Computer Science.
- To attract research students and postdoctoral research fellows of the highest calibre, in the individual's own area of expertise, and to engage in joint supervision with other members of CN-CR to enable new lines of interdisciplinary research.
- To lead delivery of research in own area of expertise, including attracting external research funding.
- In collaboration with existing lab members provide leadership of the research activities of the intelligent robotics laboratory, and robotics related activities across the college including leading funding proposals within and across academic units, career development and mentoring of researchers, and links with industry, including exploitation of research.
- To contribute to the planning, design and development of innovative degree programmes within the fields of Computational Neuroscience and/or intelligent robotics, linking to other activity in the School of Computer Science, School of Psychology, and the Colleges of Life and Environmental Sciences, and Engineering and Physical Sciences more broadly.
- To contribute to the accreditation of courses and quality assurance within CN-CR, the School of Computer Science, the College of Engineering and Physical Sciences and the University more generally.
- To set, mark and assess work at postgraduate and undergraduate levels within the School of Computer Science.
- To design and deliver excellent teaching and assessment within the School of Computer Science, CN-CR and within own area of subject specialism, through lectures, seminars, tutorials, exercise and lab classes.
- To contribute to the management of teaching and research in CN-CR, the School of Computer Science, the College of Engineering and Physical Sciences, and the University generally, by eg. committee membership.
- To contribute to leadership, decision-making and management in the School of Computer Science and the College of Engineering and Physical Sciences.
- To play an active role in the formulation of the School of Computer Science's and the College of Engineering and Physical Sciences' strategy and policies.
- To facilitate closer academic collaboration across the University.
- To represent the field of study as required in the University and externally.

## Knowledge, skills, qualifications and experience required

The successful applicant will have an internationally leading research profile including strong evidence of international esteem and an outstanding record of high impact publications in academic journals. He/she should demonstrate a strong record of supervising doctoral students to successful completion. Evidence of the ability to attract significant external research funding is essential. Candidates should also demonstrate academic leadership experience in the development and delivery of teaching programmes.

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## Centre for Computational Neuroscience and Cognitive Robotics

The Centre for Computational Neuroscience and Cognitive Robotics (CN-CR) arises out of an investment by the University of Birmingham that builds on existing strengths in the Cognitive Neuroscience and Intelligent Robotics. The ten staff to be appointed will work with a large existing team of academics and support staff. The labs involved in CN-CR include most of the groups working on Behavioural Neuroscience in the School of Psychology, led by Professor Glyn Humphreys ([www.psychology.bham.ac.uk/research/groups/behaviour/](http://www.psychology.bham.ac.uk/research/groups/behaviour/)). These include the Sensory Motor Neuroscience Lab (Professor Alan Wing, [www.symon.bham.ac.uk](http://www.symon.bham.ac.uk)), the Predictive Sensory Motor Lab (Professor Chris Miall, [www.prism.bham.ac.uk](http://www.prism.bham.ac.uk)), the Cognitive Neuroimaging Lab (Professor Zoe Kourtzi, [psg275.bham.ac.uk/cnil](http://psg275.bham.ac.uk/cnil)), and the Neuropsychology group (led by Professor Humphreys and Professor Jane Ridoch) with a particular emphasis on visual perception and cognition (Dr Welchman, Dr Harris, Dr Schofield). In the School of Computer Science the Intelligent Robotics Lab (Dr Wyatt, Dr Dearden, Dr Hawes, Professor Sloman, [www.cs.bham.ac.uk/go/irlab](http://www.cs.bham.ac.uk/go/irlab)) is the primary participant, although there are also related research groups in Natural Computation (Professor Yao), and Medical Image Understanding (Professor Claridge). There are related labs in the School of Biosciences (Animal Cognition, Dr Chappell and Dr Thorpe), Manufacturing and Mechanical Engineering (Microsensing, Dr Ward), and Electronic Engineering (Speech, Professor Russell). In total there are about 90 active researchers working in the core labs of CN-CR, with another 90 working in related areas.

The various labs in Psychology hold external research funding of the order of £8m and the Intelligent Robotics lab holds in excess of £2m. The groups in psychology are currently housed in the Behavioural Brain Sciences Centre (BBSC, [www.bbs.bham.ac.uk](http://www.bbs.bham.ac.uk)) building, which was established in 2000 to provide purpose built laboratory facilities for the study of perception, action and language. Members of these groups also have access to the Birmingham University Imaging Centre (BUIC [www.buic.bham.ac.uk](http://www.buic.bham.ac.uk)), which has a 3T Philips Achieva MRI scanner. It has state-of-the-art stimulus delivery and recording equipment, including eye tracking and limb movement recording in the scanner, transcranial magnetic stimulation (TMS) and 64 channel simultaneous EEG recording. The robotics group are housed in the School of Computer Science with currently 116m2 of purpose built lab space and a suite of robot research platforms including a B21r, three other mobile platforms, three stereo heads, and a pair of robot manipulators.

## School of Computer Science

The School of Computer Science at the University of Birmingham has an established and growing international reputation for research and teaching in Computer Science and Artificial Intelligence. The School has around 130 active researchers (37 permanent academic staff, 21 research staff and about 70 research students) and is a close knit community that enjoys a stimulating intellectual environment. Both in teaching and research, our staff and students address issues of importance to the scientific community, business world and government agencies. Our research programmes are supported by a wide range of bodies, including UK and EU Research Councils, overseas governments and universities and UK and multi-national companies. Research is also undertaken collaboratively with universities and research laboratories throughout the world. The School has research groupings in:

- Natural Computation (Evolutionary and Neural)
- Machine Learning
- Intelligent Robotics and Cognitive Architectures
- Reasoning
- Language and Interaction
- Medical Image Understanding
- Formal verification and computer security
- Parallel and distributed computing
- Mathematical foundations of computer science
- Principles of programming

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In the UK Research Assessment Exercise (2008), 30% of our research activity was rated internationally leading (the highest possible rating), and 45% internationally excellent (the second highest rating). This ranks us between 7th and 12th among all 82 UK computer science departments submitted (the variation depends on the metric used). The School of Computer Science currently holds in excess of £12m in external research funding from a wide variety of agencies. The School has improved its ranking relative to other CS departments in the UK in each subsequent Research Assessment Exercise. We are also strong in industrial collaboration as evidenced by CERCIA, the Centre of Excellence for Research in Computational Intelligence and Applications, which partners with over 36 companies.

The School has approximately 350 undergraduate students and 110 taught postgraduates. We attract students from all over the world, though the majority of them are UK nationals. Through our wide range of programmes, including the UK's oldest and most successful conversion MSc, our students are offered a depth and breadth of knowledge, combined with strong technical skills. The School offers undergraduate programmes in Computer Science, Software Engineering and Artificial Intelligence, and taught postgraduate programmes in Computer Security, Intelligent Systems Engineering, Advanced Computer Science, Natural Computation and Internet Software Systems. The School of Computer Science achieved the highest possible grades for teaching quality in our assessment by the UK teaching quality agency in 2003, and we are ranked 5th from 90 UK CS departments in terms of the satisfaction of our undergraduate students with our programmes (National Student Survey, 2008).

The School of Computer Science is housed in a modern building with a medical imaging lab, a robotics lab, and around 160 desktop machines for teaching. We also run two research clusters, and have access to the central Blue Bear cluster for high performance computing. All computer facilities within the School of Computer Science are run by a team of six computer officers and one technician.

Further information about the School of Computer Science is available at [www.cs.bham.ac.uk](http://www.cs.bham.ac.uk)

## School of Psychology

The School of Psychology at the University of Birmingham is one of the strongest research and teaching Departments in Psychology in the UK, with a ranking of 3rd in the 2008 Research Assessment Exercise and a score of 23/24 on the Teaching Quality Assessment. There is currently a teaching staff of around 50 people, who deliver courses at both undergraduate and postgraduate levels, plus 50 postdoctoral research fellows and research assistants, and 66 doctoral research students. We offer a lively intellectual environment for teaching and research; there are strong international links and regular international visitors into the School. Current research grant income is around £11 million, and comes from a number of sources: research councils (BBSRC, EPSRC, ESRC, MRC), charities (The Wellcome Trust, The Leverhulme Trust, the Joseph Rowntree Foundation, the Stroke Association), the European Union, the NHS and Government Departments (the Home Office, the Department of Health), and from Industry. There are two EU-funded training networks for postgraduate students and postdoctoral fellows. In addition to the research-focused doctoral programme (PhD), courses at postgraduate level include: a taught doctorate in Clinical Psychology (DClinPsy., around 25 students per year), the only taught doctorate in the UK in Forensic Psychology (around 30 students), and MRes courses in brain imaging and cognitive neuroscience, cognitive neuropsychology and rehabilitation, and cognition and computational modelling (around 20 students).

Research within the School is organised into 3 groupings with overlapping memberships:

- Behavioural Neuroscience (including 3T fMRI, ERP, TMS and neuropsychological studies in cognitive and sensory-motor neuroscience, and psychopharmacology)
- Developmental, Social and Applied Psychology (including developmental, clinical/health, forensic, and social psychology/social cognitive neuroscience)
- Language, Cognition and Perception (covering vision perception and cognition, language comprehension and production).

Across these groupings, though, there are very active research collaborations including: social cognitive neuroscience, the use of developmental paradigms to understand normal and impaired

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theory of mind in adults, the neural underpinnings of socio-pathic behaviour, the neural basis of eating, and cognitive abilities in developmental and genetic disorders. There are three research centres based in the School (the Behavioural Brain Sciences (BBS) Centre, the Centre for Forensic and Criminological Psychology, and the Cerebra Centre for the Study of Neurodevelopmental Disability in Genetic Disorders). The School is a major partner in the Birmingham University Imaging Centre (BUIC) (research-based 3T fMRI) and provides the current Director (Professor Glyn Humphreys). The Cerebra Centre brings together researchers interested in the interplay between behavioural, cognitive and neural disorders in individuals with neurodevelopmental disabilities.

The School is housed in two neighbouring buildings (Frankland and Hills) and offers state-of-the-art facilities across a range of different areas. The Frankland Building houses the Centre for Forensic and Criminological Psychology. There are laboratories for research in social cognition, for psychopharmacological studies of human cognition, laboratories with kitchen and olfaction facilities, a 'Babylab' with infant EEG and equipment for habituation studies, 2 laboratories with built-in video and video-analysis systems (1 in developmental psychology), and a histology laboratory, a 128-channel EEG/ERP laboratory, laboratories for studies of speech production and visual perception. The Hills Building houses the BBS Centre. This contains laboratories for: brain imaging (MR analyses), EEG and event-related potential (ERP) studies (128 channel), trans-cranial magnetic stimulation (TMS, 3 systems including Brainsight frameless stereotaxy), eye movement analysis (5 systems), 3D kinematic analysis (3 systems), neuropsychological screening, studies of active touch and cross-modal sensory integration (2 Phantom robot systems, a virtual reality 'reach-in' system), a laboratory for computational modelling, a kitchen area for studies of everyday activities, and laboratories for studies of speech production, binocular depth perception, and reading. There are further laboratories for the analysis of functional brain imaging studies, linked to the BUIC centre, which is about 5 minutes walk away. The School has one of the largest panels of well-characterised neuropsychological populations in the world and is a partner in the West Midlands Mental Health and Stroke Research networks. There is excellent technical support for research in all areas of the School.

Further information about the School of Psychology is available at [www.psychology.bham.ac.uk](http://www.psychology.bham.ac.uk)

## The University of Birmingham

The University of Birmingham has a distinguished academic reputation. It is a member of the Russell Group and belongs to the international network Universitas 21.

The University was founded in 1900 at the initiative of local citizens and is now one of the largest in the UK offering degrees across a wide range of disciplines from Education to Medicine and from Engineering to Law. It is a major international centre of academic excellence, and was 66th in the Times Higher Educational World University Rankings (2009), and 91st in the Jiao Tong, being 10th and 11th by those rankings among all UK universities. Eight former members of the university have been Nobel prize winners.

The University has a turnover of over £400 million per annum and is currently undergoing an extensive capital programme. This positive financial position is almost unique in the UK Higher Education sector and provides a firm foundation for further investment.

One of the University's greatest assets is its Edgbaston campus. It offers its community of over 25,000 students and 6,000 staff an attractive environment in which to study and work. It is situated only two miles from the centre of a major European city and yet is set amongst green and leafy parkland which is largely pedestrianised, and provides a beautiful and pleasant backdrop for imposing Victorian redbrick buildings as well as some striking modern architecture.

The University of Birmingham is an Equal Opportunities employer. It aims to ensure that no job applicant or employee will receive less favourable treatment on the grounds of race, colour, nationality, ethnic or national origins, sex or marital status: this policy will include disabled persons who have the necessary attributes for the post. The University will operate selection and promotion criteria and procedures that are designed to ensure that individuals are selected, promoted and treated on the basis of their relevant aptitudes, skills and abilities.

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## Procedure for application

Applicants are invited to submit their application on-line to us, via [www.hr.bham.ac.uk/jobs](http://www.hr.bham.ac.uk/jobs). You will be asked to provide basic personal information and contact details and give the details of three or more referees. You will then be asked to attach a covering letter and up-to-date curriculum vitae. These documents must be in either PDF or word format and should address how you would be able to fulfil the requirements of the post, including a statement of teaching and research plans. Also please provide links to online copies of recent research papers. Any applicants who would prefer to submit this information in hard copy should please send to: Sally Johnson, Senior Appointments Administrator, Human Resources, The University of Birmingham, Edgbaston, B15 2TT.

Informal enquiries should be directed in the first instance to:

**Dr Jeremy Wyatt**

School of Computer Science

Email: [j.l.wyatt@cs.bham.ac.uk](mailto:j.l.wyatt@cs.bham.ac.uk)

and

**Professor Achim Jung**

Head of the School of Computer Science

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