

UK ACADEMICS TO ADDRESS THE FUTURE OF COMPUTING

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Two of the big computing issues - developing systems that never fail and getting computers to act like humans - are being proposed as long-term research projects by the UK's leading university professors.

These projects, plus four other proposals in areas ranging from distributed systems to the modelling of plant and animal behaviour, have resulted from a grand challenges workshop sponsored by the UK Computing Research Committee, a BCS expert panel, with support from the Engineering and Physical Sciences Research Council. 'Grand challenges' is the name given by the scientific community to long-term initiatives involving separate projects which might need national or international coordination.

The proposers of the research into dependable systems are in no doubt about their aim: "We propose to solve the dependability problem for evolving systems once and for all."

Over 15 years they propose projects to develop methods, tools and infrastructure to enable software "to be developed to be truly dependable, at lower costs and with less risk than today".

Another group aims to "create a computational architecture of the brain and mind which is inspired both by the neuronal architecture of the brain and high level cognitive functioning in humans." This will be achieved by capturing the information processing principles present in the brain to describe how low level neuronal processes are linked and integrated with high level cognitive capabilities such as adaptability, self-awareness and creativity.

The results could include a major contribution to work on mental disorders, and the laying of foundations for "a radical new generation of machines which act more and more like humans".

Such systems could work as domestic robots, helping for example to care for disabled people, and provide new facilities for teaching and for intelligent access to information.

Two proposals relate to distributed systems to cope with ubiquitous computing, supporting the design of networks that can expand and handle a growing variety and number of devices.

The fast expanding amounts of information that people and organizations hold about themselves, including photographs, sound recordings, emails and web browsing

histories, bring the challenge of managing and searching these different data forms - and storing them safely after current storage and access software come to the end of their lives.

This issue is the subject of another research proposal, which sees benefits including the potential broadening of information access to disabled people and those with special educational needs, by matching information systems to individuals' circumstances. Access to different types of information on individuals could also help in other areas, such as health care.

Another research proposal is to develop computer models of life forms, using the already fast growing mass of biological data. This could lead to experiments run on computers, and to models of the interaction of organisms and the social behaviour of different life forms.

Details of the proposals are available on the [UKCRC website](#) where there is also an open discussion of each one until 26 May. A final report will then be prepared for the UK Computing Research Committee, which may be conducting workshops on each proposal and take projects to funding bodies.

For further information please [contact the BCS Press Office](#).