The UK Research Grand Challenge Effort

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Preferred duration: 25 minutes

Can find no information about the contents of the pre-program, so therefore do not know whether I will attend or not.

Abstract

The UK Computing Research Committee (UKCRC) is a joint Expert Panel of the British Computer Society (BCS) and the Institution of Engineering and Technology (IET); its brief is to report and advise on issues contributing to the advancement of UK Computing Research. The Committee is currently supported by the BCS and IET. One immediate goal, in 2002, was to assist in the implementation of the recommendations of the International Review of UK Research in Computer Science, commissioned and published jointly by the EPSRC, BCS & IET.

The UKCRC sponsored a workshop to assemble a collection of long-term grand challenges for Computer Science, which could contribute to the long-term advancement of the subject, and which could be selectively adopted as a basis for policy by the funding bodies. The initial meeting yielded broad grand challenge categories; efforts since then, including two subsequent conferences (in 2004 and 2006), have refined these into focused networks of UK researchers aligning their research efforts to address these challenges and working with UK funding bodies, where appropriate, to achieve targeted funding programmes. A small committee for each Challenge has been set up to carry it forward, together with an overall Steering Committee.

The current grand challenges are:

- In Vivo – In Silico

  This Grand Challenge aims to realise fully detailed, accurate and predictive computer embodiments of plants, animals and unicellular organisms.

- Ubiquitous Computing: Experience, Design and Science

  This Grand Challenge is focused on modeling, designing, implementing, integrating, managing and using the ever-burgeoning population of 'effectively invisible' computers around us, embedded in the fabric of our homes, shops, vehicles, farms and even in our bodies.

- Memories for Life

  The aim of this Grand Challenge is to produce a shared understanding of what is common in memory systems and use that understanding to improve efficiency, recall

and information management in an integrated way across various levels of human personal, social and work domains.

- The Architecture of Brain and Mind

  This Grand Challenge is concerned with the attempt to understand and model natural intelligence at various levels of abstraction, demonstrating results of our improved understanding in a succession of working robots.

- Dependable Systems Evolution

  This Grand Challenge is focused on the development of the scientific foundations to be able to build systems whose dependability can be justified, even in the face of the most extreme threats, to be able to put systems in inaccessible places, knowing that they will continue to work over decades. to be able to build very large scale systems with controllable costs and risks, and to be able to evolve such systems rapidly, at costs which reflect the size of change, not the scale of the system.

- Journeys in Nonclassical Computation

  This Grand Challenge seeks to explore, generalise, and unify the many diverse non-classical computational paradigms and to produce a fully mature and rich science of all forms of computation that unifies the classical and non-classical (natural) computational paradigms.

- Learning for Life

  This Grand Challenge aims to develop new forms of e-learning environment and the effective use of new e-learning tools and facilities. The four main themes to this challenge are: how to best model and represent learners within e-learning facilities and how to assess these over time, how to develop facilities that support learning outside formal educational settings over a learner's lifetime, how to encourage and support creativity and problems solving with and through e-learning facilities, and how to ensure that learning for life is a viable option for all, and that the facilities provided reflect the diversity of learners.

This presentation will focus on the process by which these Grand Challenge themes were generated, with special emphasis upon guaranteeing that ownership of the themes was retained by the research community. I will describe the overall level of steering required, and some of the successes and failures to date for the activities. These activities will be compared/contrasted with similar activities in the US. I will also discuss compare the UKCRC and the newly-created CCC (Computing Community Consortium) in the US.