Research Consortium in Speckled Computing

0 - Title of Atelier and proposer(s)

Title: Speckled Computing

Proposer:

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1 – Atelier content

Speck is a miniature programmable device which combine sensors, a processor and wireless networking. The specknet is designed to be a collection of autonomous specks which offers distributed services: each speck is capable of sensing and processing the data *in situ* under program control; the specks themselves are connected as an ad-hoc wireless network which collaborate to process information in a distributed manner.

Specknets play an important role of linking the digital world of computers to the physical world of sensory data. For example, a specknet on the person (with specks distributed on the body) will be capable of tracking the limbs, head and torso, or the position of the person in the environment, and this information can be stored, manipulated and accessed remotely over the internet. Computing with specks or Speckled Computing, affords new models of unencumbered interaction with the digital world, in which the physical environment is the primary site of interaction.

Specknet is an enabling technology for the design of future people-centred interactive systems for the following reasons. The internet as we know it is

one billion strong and is an indispensable tool for communication among people and businesses. The new Internet Protocol Version 6 (IPv6) will support more than 35 Trillion separate subnetworks, each of which could connect millions of devices. We are moving towards a world of connectedness of people and 'smart' objects, i.e., objects which are context-sensitive and location-aware. Specks endow these smart objects with the necessary sensing and processing capabilities, and bridges wirelessly the physical world of objects and people, to the digital world of computers and the internet.

2 - Relevance to School Title, Scope and Aims

a) The School Title (i.e. "Technology, Enjoying or Enduring it? - Visions, Boundaries and Transformations in Extending or Replacing Human capacities")

Specks can transform the way in which humans interact with the digital world. The body, sensitised with specks, becomes an interface in its own right with the digital world. Motion and actions can be recognized and interpreted leading to unencumbered interactions in smart ambient environments.

b) The School Scope (i.e. "international interaction design summer school promoted in the Convivio project framework [i.e. people-centered design of .]")

see above

c) The School Aims (i.e. "contributing to the building a community of practice in people-centered design of interactive technologies". E.g. here reference to the Edinburgh Festivals participants can be made.)

The atelier could develop around the theme of "Specks in the City": Edinburgh during the month of August will be host to a lively arts festival, and the atelier could develop people-centered design of interactive technology based on specks to share information, interests and reviews using speck-based personal wrist devices, and stationary speck-based nodes, based on a decentralized, peer-to-peer model of interaction.

3 - Atelier Leader Experience

The lecturer has had experience of developing ideas in interactive systems into proof-of-concept prototypes using specks by working in collaboration with sculptors and product designers at the Edinburgh College of Art, Napier University and Duncan of Jordanstone College of Art. He has also delivered a speck-based Interactive Design course to the Master's in Fine Arts students at the Edinburgh College of Art in Spring 2006.

4 - Scientific Novelty and Value

The Consortium has developed miniature specks which combines sensing, processing and wireless networking capabilities, together with the networking protocol and firmware for distributed interactions in a peer-to-peer manner. The atelier will have access to cutting-edge technology and expertise to realise ideas in people-centred design of interactive systems into prototypes which can be assessed and validated using ethnographic methods. The combination of unique specknet technology and the experience of developing and deploying specknet-based systems is of significant value to researchers and practioners in interactive technology design.

5 -Overall Judgement

There might be uneasiness in using speck technology. This will be overcome by supporting the atelier work with a number of doctoral students and research assistants to work in the atelier to support its activities. In other words, the risk of using novel technology will be managed by employing support staff with experience of realsing a number of ideas into practical prototypes. The lecture will also illustrate case studies in the realisation of these ideas.

6 - Recommendation for Retaining the Atelier in the School Programme

Participants will have the opportunity to work with an emerging technology which will be one of the platforms for future ubiquitous computing applications in which size matters. This atelier will be of interest to people who are keen to demonstrate their ideas, i.e. realise them as actual prototypes. Participants can both learn from the experience and evaluate the product and the design process.