Expressive Interaction for Sustainability and Empowerment

New technologies are changing the way people interact with each other across distances, geographies, cultures, and devices. In particular a new swath of technological innovation concerning expressive interaction is just beginning. These technologies emphasize touch and gesture over screen and keyboard. They involve ubiquitous, mobile interaction with large shared public surfaces. If designed thoughtfully the new forms of interaction that are enabled will lead to sustainable designs and empowered individuals.

It was the recognition of this imminent change in human-computer interaction that led to this first international workshop on Expressive Interaction for Sustainability and Empowerment, EISE. The workshop is supported by *Interaction*, a specialist group of the British Computer Society and hosted by Vodafone. There are eleven fully refereed contributions coming from three continents and two keynote lectures from industrialists promoting sustainability and technologies for empowering individuals in the twenty-first century.

In the first paper session on Inclusive Sustainability Lucia Terrenghi (Vodafone) and Sriram Subramanian from the University of Bristol argue for cultural sustainability and see the discipline of human-computer interaction (HCI) as a natural home for this in interactive systems development. HCI needs to balance the local context and cultural diversity with the demands of global communication and the economic drive for standardisation. Anirhuda Joshi from IIT Bombay looks at economic sustainability and the use of mobile phones in India. He provides a rich and fascinating variety of case studies to illustrate three key themes of design for economic sustainability: creating a capacity to consume; high-tech and high-touch; rethinking ground up. In the third paper Rama Vennelakanti and Sriganesh Madhvanath (HP Labs, India) look at the context of a rapidly changing India and the impact this is having on new technologies and how they are developed. Opportunities for new devices to help with literacy and better communications between people are discussed.

Session 2 is concerned with gestures and mobility. Stephen Brewster and his colleagues from the University of Glasgow present a review of new interaction techniques that are becoming increasingly common thanks to miniaturisation of sensors and effectors. Gestures such as shaking, turning and waving are now available for interaction designers to make use of in new technologies. They also review the impact that sound, tactile feedback and proximity is having on human-computer interaction. Santanu Chaudhury and Aditya Khandelia (IIT Delhi) look at handwriting as an interface; something that remains one of the most basic and effective tools for communication. Kaustubh Srikrishna Patwardhan (IIT Bombay) and Sumantra Dutta Roy (IIT Delhi) focused on the technology for recognizing and tracking gestures in 3D space.

The third paper session is focused on case studies of expressive interaction. S Dey and Anupam Basu (IIT Kharagpur) and R. Mukherjee (ITME Kolkata) deal with the issue of the multiple languages that are spoken across the sub-continent. They describe a potable version of a proven augmentative and alternative communication tool called Sanyog. Melissa Loudon (University of Cape Town) and colleagues from the universities of Bristol and Southampton describe a system for measuring water quality utilising mobile phone technology. The system keeps a 'human in the loop', resisting the takle over of all activities by technologies alone. In the tid paper Sunyoung Kim and Eric Paulos describe work in progress on building systems to detect and display air quality.

The final session concerns near-end development. Alan Dix (University of Lancaster) with colleagues from HP Labs Bangalore and the National Institute of Design (Bangalore) explore the opportunities of delivering novel content to mobile phones. The unique difficulties of providing development environments for small mobile devices are discussed. Finally Peter Gall Krogh, Martin Ludvigsen and Marianne Graves

Petersen (University of Aarhus) present their views on sustainability and interaction design. They present seven articles for sustainable design.

In addition to these papers, keynote talks were provided by Chris Burgess and Eric Shaffer and panel sessions were held to discuss the wide ranging issues involved in sustainability, empowering people — particularly near to their place of work — and including them in the benefits that new technologies are providing.

Overall this first international workshop on expressive interaction for sustainability and empowerment has shown that there is a critical mass of people concerned and excited about the changing world of new technologies. The limited forms of interaction we have now (typically a key board and screen) are giving way to exciting new opportunities such as gesture, sound and touch. The aim of the EISE community is to harness these opportunities for the benefit of the widest range of people. We think that this first workshop is the first step along this new road.

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