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What Is Hot in CHI

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Introduction

As the premier international forum on human-computer interaction, "ACM Conference on Human Factors in Computing Systems" (CHI), has continued to grow and broaden its range of topics and contributing disciplines. CHI 2014 received over 2000 submissions. Those papers and notes were from diversified research domains—including psychology, computer science, sociology, engineering, communication sciences, design and arts, among others. Here, I would like to introduce progress in HCI research which will bring new opportunities and challenges to AI community.

Disappearing Boundary between the Digital and Physical World

How people interact with machines and physical environments dramatically changed in the past decade. Recent advances in sensing, displays and processing have motivated and enabled increasingly ubiquitous interactive computing technology. For example, the emergence of smart wearable devices, such as smart watches and smart eyewear introduces interactions beyond the usage of a single device.

The ways in which people consume information and make decisions are also changing rapidly. For example, multi-touch devices have become very affordable and powerful. This provides an opportunity for novel data visualization and interactive clustering techniques. Smart motion sensing controllers, such as Nest, utilize machine learning, and impact users' pattern of HVAC control at home. Based on the predictive control interface, a study found users had less interaction with the Nest over time.

In CHI 2014, there were several sessions focused on utilizing personal data from various sources and exploiting this data to produce estimates and knowledge. Personal activity tracking is enmeshed with everyday life. That tracking information is often used and interpreted with reference to daily or short term goals and decision making for not only health and wellbeing but also for workload and performance.

By leveraging existing technology, such as Google Glass, many applications already overlay digital information over the physical, real-world environment. On the other hand, tangible user interfaces are still very desirable in collaboration, learning and design application contexts. By giving physical forms digital information, a tangible user interface can take advantage of human abilities of grasping and manipulating physical objects and materials.

Future of Making

New manufacturing technologies and design processes for personal fabrication attracted great interest in the CHI community. HCI has employed radical envisionment of future technologies as part of its research program. Many DIY makers are turning visions of tangible and ubiquitous computing into products. Because traditional manufacturing technology is often a major challenge for DIY makers, there is a rapidly growing body of work that explores applications of this emerging fabrication technology, including the possibility of creating novel 3D printed interfaces, of developing interactive tools for integrating the design and fabrication, and of rapid fabrication of interactive systems.

3D printing technology has been expanded from being a tool for rapid prototyping of shapes to printing functional objects. With multi-material 3D printers, it is becoming possible to fabricate not only passive mechanical components, but interactive functional electromechanical devices, such as speakers.

Since 3D printers and laser cutters are becoming increasingly ubiquitous, researchers are also exploring new design process and tools to lower the barrier for users to engage in personal fabrication. For example, instead of 3D modeling,

technologies such as immersive augmented reality can capture existing physical objects effortlessly into the new design process. Currently, those advancements are limited in specific domains. General function-based design approach and tools that can leverage new fabrication technologies are still not deeply explored.

Human Computer Intelligence

Machine learning has been widely used in CHI papers for a board range of tasks, such as classification, activity predication, gesture recognition and user modeling. Several interactive systems have also been introduced to improve the labeling and data sampling in the training process.

On the other direction, it has been recognized that computers still do not possess the basic conceptual intelligence that most humans take for granted. But unlike computer processors, humans require some incentive to become part of a collective computation. Online games are a seductive method for encouraging people to participate in the human computer collaboration process. In addition to gamification, multiple approaches have been proposed to improve the quality of work done by crowd sourcing platforms. There are also social networking services where users can ask their followers and friends' questions without incentive. Based on the social cost model of *friendsourcing,* we can estimate the value of the attention and effort from their social network.

CHI Conference Research

Effort has been made to organize the CHI conference sessions around themes (Chilton et al. 2014). By decomposing the session-creation problem into meta-data elicitation and global constraint satisfaction problem, this process can be managed by both a large group of experts and a smaller group of committees. Liu et al. (2014) and Padilla et al. (2014) apply multiple analysis methods to visualize the intellectual landscape of the CHI conference. In order to further improve the experience for CHI attendees, Project Paperforager[1] also explores new ways to interact with a large collection of ACM CHI and UIST papers.

We presented the main innovative methods and techniques in CHI 2014 conference. We believe that those advances and challenges provide new opportunities for many fields of AI playing important roles in human-computer interaction research.

[1] www.autodeskresearch.com/paperforager

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