

Internet of Things Workshop: Enabling Futures

Aaron Tan

Faculty of Architecture, Building and Planning
The University of Melbourne, Australia
aaron.tan@unimelb.edu.au

Aneesha Bakharia

Faculty of Science and Technology
Queensland University of Technology,
Australia
aneesha.bakharia@gmail.com

ABSTRACT

The "Internet of Things (IoT)" is an emerging and novel design paradigm that is changing the way we live our lives and presents a groundwork for thinking about the implications and applications for connected, networked, and interactive spaces.

Imagine a world where everything can be both analogue and digitally approached - in which smart objects provide seamless communication and contextual services such as smart rooms, intelligent transportation, e-health, power management, etc.

With the Internet of Things (IoT) - the networked connection between everyday objects, now including smart phones and tablets, social media, super fast broadband, and real-time instrumentation, we already have all the necessary tools to deliver smart cities [1]. So how can we harness the power of these emerging technologies to its full potential?

In this proposal, we describe the goals, themes and format for the Internet of Things Workshop at OzCHI 2012.

Author Keywords

Internet of things, emerging technologies, ubiquitous computing, mobile, intelligent cities, networked, wireless sensor networks, collective intelligence, smart city, smart objects.

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION

We are at a cross section of global change and transformation. With a truly "connected world" closer to becoming a reality, many predict that 50 to 100 billion of Internet connected things by 2020. Many have used Information and Communications Technology (ICT) to improve performance at an organisational level including mobility, utilities, community and eGovernment services [1]. In these cities, "smart technologies" and "open innovation" are creating more efficient systems and better connected communities.

As part of the growing ubiquity and pervasive reach of technology, there has been, accordingly, expanding interest in how interaction with technology in public and semi-public places plays out [2]. Shopping malls, stadiums, music and performance festivals, and urban centres are just some of the spaces in which mobile phones, digital photography, large screens and other projections, and infrastructures such as RFID, are deployed by and for communities. Any object that carries a RFID tag relates not only to you, but also through others - being read by a RFID reader nearby, to other objects and spaces, relations or values in a database. In this world, you are no longer alone, anywhere. The technologies found within these settings poses exciting new challenges for the design and implementation of pervasive and context-aware systems.

The IoT technology is at the heart of a metamorphosis, and is rapidly gaining global attention from academia, corporations, and governments. In this workshop we are interested in developing our understanding of communities, the paradigm shift in technology and observing the metamorphosis that everyday things are going through - from things that connect people and objects to those that are learning-to-think and others that will learn-to-perceive (sense and response).

GOALS AND AIMS

Principles such as collaboration, innovation and participation is stimulating the kind of innovative thinking needed to tackle complex issues ranging from participatory citizenship to urban livability. This workshop will explore how the IoT not only connects physical and digital spaces, but how these networked spaces and objects might become playfully responsive characters that engage people and interact with the built environment in new ways. We seek to address the issues surrounding the integration of emerging technologies with the highly varied assemblies of intelligent or smart city that perhaps exist already within these spaces or will be deployed in them in the near future.

The key components of emerging technologies are found in a variety of loosely-related current research areas in HCI—or, more broadly, interaction design. Themes of interest include:

- virtual and augmented reality
- RFID, sensors technologies and context-aware systems
- urban user experience

OzCHI 2012 Workshops Programme, Nov 26 & 27, Melbourne, Australia.

Copyright in material reproduced here remains with the author(s), who have granted CHISIG a licence to distribute the material as part of the OzCHI 2012 electronic proceedings. For any further use please contact the author(s).

- ubiquitous, pervasive, and handheld interaction
- mobile and tangible user interfaces
- perceptual interfaces
- sensing interfaces
- affective computing
- sustainable design and technologies
- cloud computing interworking
- social network analysis.

AUDIENCE

It is expected that this workshop will be of special interest to a range of researchers and practitioners including those from areas such as Urban Informatics, Human-Computer Interaction, Interaction Design, Information Technology, Computer Science, Electrical Engineering, Information Architecture, Anthropology, Psychology, Communication Science, Cognitive Science and other related fields.

EVENT FORMAT

This workshop will include talks by established international and national researchers who have contributed to the area of emerging technologies and ubiquitous computing, as well as other speakers who are experts in relevant fields. We welcome participation from a range of disciplines, from both academia and industry. We want to involve as many as possible in discussions, in order to encourage the development of research collaborations and to foster inter-disciplinary work. Ideally the workshop would involve at most 20 participants (including organisers). Interested parties will be required to submit a short position paper outlining their interests and work with emerging technologies which may describe ongoing work, recent results, or opinions and approaches to the problem.

In order to share data between researchers, the workshop would include a 'data session' in which participants briefly present (e.g., 5 mins) the background and context to their data (e.g., video, audio, ethnographic collections), which is then explored collectively by those present. These observations can then drive common perspectives and future activities towards an Internet of Things.

Following from the presentations, participants will be divided into small, interdisciplinary working groups to share their own work, exchange ideas and meet others with similar interest. The workshop will conclude with a plenary to discuss ideas and issues identified, share results, and discuss further steps and collaboration arrangements beyond the workshop.

Requirements

List of Technology Support

- Projector and screen (for projecting from participants' own laptops)
- Internet connection

List of Other Support

- Flip chart

- Whiteboard, or blackboard and corresponding markers
- Sticky notes
- Pen and paper

Nice, but not essential:

- Name tags

SUBMISSIONS AND PARTICIPANTS

In order to attend the workshop, participants are asked to present short papers describing:

- research interests pertinent to the workshop theme(s);
- design methods and processes used when working with IoT;
- how emerging technologies and IoT can be extended to support generic systems;
- thoughts on issues deemed to be important and potential points of interaction with other disciplines.

We invite contributors to think beyond sensor networks and web applications, and to imagine, design, build, evaluate and share their thoughts and visions on what the future of smart cities and the Internet of Things will be. Papers should show potential contributions to the workshop goals, such as interaction designs or ideas toward new conceptual frameworks or theories. Papers will be peer-reviewed and 15-20 will be selected according to their relevance to the workshop and the likelihood that they will stimulate and contribute to the discussion.

We will provide a web site before the workshop. All selected papers will be made available to the participants on this site, along with other workshop information and some background readings to start discussion. The web site will be maintained after it, to help the participants and this emerging community keep in touch.

OUTCOMES

During the workshop a poster will be produced to be presented during the CHI 2013 conference summarising the ideas produced by the workshop as well as a report for the SIGCHI Bulletin or other appropriate venue. We will continue to maintain a web presence to serve both the participants and the broader community developing around this topic. It will also serve as a nexus for continuing and collecting work in this topic well after the workshop. If the position papers and workshop discussion reflect sufficient progress and cohesiveness, we will work toward producing a special issue or section of a journal or possibly an edited book. However, it is more likely that this would be an outcome of a second workshop or small conference on this topic, and that this one will start the discussion and form the community for it.

REFERENCES

1. Buscher, V., Doody, L., and Hill, Dan. Smart Cities: Transforming the 21st century city via the creative use of technology (October 2010). Arup, 3.
2. Reeves, S. et al. Designing the spectator experience in *Proceedings of CHI '05*, ACM Press, 741-750.