



*Special Issue on*

## *Designing for Systems of Smart Things*

Full Paper Due : Extended to 15 May 2017

### Call for Papers

Systems of smart things, or IoT systems, have entered our everyday life and are shaping and enriching it in many ways. Yet design and design research have lagged behind in exploring the fascinating qualities of these systems of connected things, with their inherent complexities and emerging properties. Our next special issue of the *International Journal of Design*, therefore, aims at establishing a platform for design research on systems of smart things. We hope this platform will become a means for shedding light on the social, theoretical, technological, and philosophical challenges of designing these systems.

---

The current notion of the Internet of Things has its origin, beginning decades ago, in the development of ubiquitous computing, and later when ambient intelligence emerged. Since then, technologies have matured and spread significantly, bringing connected devices and services into the home and into direct proximity with end-users. However, while the Internet of Things has been a success for many enterprises and for several industrial sectors, it is not yet a success for the majority of end-users in home environments at the fringe of the cloud. Many studies reveal that, beyond inspiring initial amazement, current connected devices, among average users, add little value over their unconnected siblings. They focus too much on narrow use-cases in mostly hypothetical scenarios, and thus often fail to provide a truly out-of-the-box experience. So far, connected devices, and even more so, systems of connected devices, are simply not designed to learn and adapt in a meaningful way to our complex contextualized realities. To address these issues, we need to take the step from interaction design for a single device to interaction design for a whole system of potentially smart things or objects. What's more, we need to shift the overall context of design from a product-focused orientation towards a system-oriented approach.

In this special issue, we will therefore focus on core issues related to the design of IoT systems as heterogeneous, interactive, distributed systems that evolve or change their structure and composition over time and that encompass diverse objects, including non-smart objects, smart or intelligent devices, and also biological or natural entities such as humans and animals. We will be in general looking for research into bottom-up, "making" approaches and experiential design. In the following, we sketch out seven topic areas that we believe are of special interest.

#### **Designing for locality of IoT systems**

Local IoT systems are ones that are close to our daily lives, situated in our personal spaces and highly distributed to sense and to react to many aspects of our everyday habits and activities. How can we design for such localized, personalized IoT systems so that they can deal more effectively with meaningful knowledge that is situated in peoples' everyday lives?

#### **System Design in the context of local IoT systems**

System-level capabilities and qualities emerge from the structural and dynamic complexities of systems of smart things. Taking a step beyond Interaction Design, how can we find the necessary innovative approaches to design with and for these complex local systems?

#### **Designing for the (social) user experience of local IoT systems**

The average, everyday user has yet to fully discover or benefit from the IoT system experience. What kinds of qualities and experiences do people need, expect, or even desire when interacting with local systems of connected smart things. What are the possible strategies for designing for such an experience?

### Designing IoT systems that reflect social and cultural awareness

Local IoT systems should relate to the local techno-social culture in which they are being used. They should enable a user experience that can mediate our subjective relationship with the world that we as individuals live in and the relationships that we have with other people in that world. How can we create and design for systems that can respond to people's particular technological, social, and cultural experience?

### Designing for the niche growth of local IoT systems

IoT systems can be pre-defined only to a certain degree, as they must allow the users and the environmental context of the system to, over time, fill in the rest. How can we design for such a system so that it can grow responsively and meaningfully into its own unique niche within the surrounding techno-social ecosystem?

### Systems and connected things in design education

Design education also needs to change to fully embrace the design challenges of IoT systems. Which Systems Design fundamentals and paradigms should we adopt or further develop for design education? More generally, how should we frame the issues inherent in Systems Design in order to give students the best advantage in dealing with future developments?

### Designing for evolving systems

Future IoT systems will no longer be confined to a static or time-limited existence, as with the limitations imposed by the conventional product life cycle. Instead, they will become part of an evolutionary progression, requiring that any new devices or services must be able to merge with and respond to a system that is continuously changing. How can we cope with such a fundamental shift in our approach to design? How can we integrate our designs and design thinking to accommodate these unique, ever-evolving systems?

With this special issue of the *International Journal of Design*, we hope to provide a platform for exciting design research that deals with the rich but difficult issues of IoT systems in all their dynamic complexity.

### Schedule

- **Full Paper Due:** **15 May 2017**
- Notification of Review Results: 1 September 2017
- Final Version of Paper Due: 1 October 2017
- Notification of Acceptance: 21 October 2017
- Special Issue Publication Date: 31 December 2017

[www.ijdesign.org](http://www.ijdesign.org)

### Special Issue Editors

**Berry Eggen and Mathias Funk**

*Department of Industrial Design,  
Eindhoven University of Technology*

**Jane Y. J. Hsu,**

*NTU IoX Center /  
Department of Computer Science and Information Engineering  
National Taiwan University*

### Submission of Papers

Manuscripts should be prepared with the template file and guidelines found at [www.ijdesign.org/authorGuidelines](http://www.ijdesign.org/authorGuidelines). Submitted papers should not have been previously published nor be currently under consideration for publication elsewhere. A double-blind review process will be employed for this special issue.

Manuscripts should also be sent through the on-line system at [www.ijdesign.org/submissions](http://www.ijdesign.org/submissions). Authors should choose "*Special Issue on Designing for Systems of Smart Things*" as the Journal Section when submitting papers.