

Special Issue on

Sensorial Assessment and Modeling of Superorganisms of Things towards User's Attention

CALL FOR PAPERS

The principles of human-computer interaction have changed. After decades of thinking about how humans actively approach ICT systems, the focus is on thinking how ICT systems should approach humans. In fact, we need to go back in time when machines used to make humans attentive, like a light indicator signaling the status of a machine to its user.

During the era of personal computers, the focus was from the user to the machine, that is, human interacting with the computer. Now, the modalities of human-to-computer interaction need to be understood in an entirely different way due to drastic changes in computing paradigms shifting from personal to pervasive computing, positioned to distributed interactions, sporadic to seamless posturing, and so forth.

In the all-connected digital world of today, a lot of activity is happening in the background. In distributed technologies such as peer-to-peer computing, sensor networks, Internet of Things, and Industry 4.0, data is continuously collected, shared, and contextualized without active involvement of the users. One aspect of applications in this landscape is to achieve a common goal in collaboration, which requires distributed interactions and decision-making. Another aspect is attention management, which is how to make *relevant* humans *attentive* towards the decision made.

This means that instead of humans, now the machines need to attain human attention. This is particularly relevant to emerging technology of Internet of Things (IoT), which is the focus of this special issue. In IoT, potentially, all small daily life things will be digitized. Apparently, a single thing exists in isolation but functionally exists as a social “superorganism.” The potential and opportunities of turning massively deployed IoT systems to a globe-spanning superorganism of socially interactive personal digital assistants are a challenging arena to explore. While individual things are of heterogeneous provenance and typically act autonomously, it stands to reason that they can (and will) self-organize into large-scale cooperative collectives, with humans being mostly out-of-the-loop. Here, we refer to these emerging massive collectives of things as a “superorganism,” since they exhibit properties of a living organism (e.g., ‘collective intelligence’) on their own.

Naturally, the formation of these superorganisms is dynamic, real-time, and context-aware. Now, identifying the boundary of a superorganism based on its context, particularly from the perspective of machine gaining attention from its user (a human being or environment), and the mode (e.g., signal type) and modality (e.g., which group of machines to take the lead) of such interactions is the main theme of this special issue.

Potential topics include but are not limited to the following:

- ▶ General principles of embedded/implicit interaction, from IoT to humans
- ▶ Theories and models of embedded/implicit interaction, from IoT to humans
- ▶ Embodied activity/mobility recognition and alert: IoT applications in health, elderly care, and so forth
- ▶ Human computer confluence in the smart home, environments, and cities
- ▶ Novel complex adaptive system theories and operational principles for IoT
- ▶ Case studies/very large-scale scenarios that can serve as reference case for future superorganisms of collective things
- ▶ Group (individual) attention opportunities using peripheral displays and wearables
- ▶ Sensing, control, and actuation in IoT architectures towards attention management

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