

***Special Session***  
**Human Interactions for Cyber-Physical Systems and Internet of Things**  
*for*  
**IEEE IEMCON 2018**  
**The 9th IEEE Annual Information Technology, Electronics & Mobile Communication**  
**Conference**  
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***<http://ieee-iemcon.org/>***

**Chaired and Organized by**

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**Scope:**

It's been over two decades since the Internet of Things (IoT) term was first coined, and of late, the field is entering a new phase of rapid expansion in all areas of business, industry, domestic and personal gadgets. Comprising of the large diversity of interactive networked devices as well as embedded sensors, its ability to be uniquely identifiable and communicate and interact with other devices, objects and humans is profound. The combination of research and development efforts both in academia and industry in IoT has opened up new avenues of research on how the ubiquitous connectivity can enhance our every-day lives.

Besides, cyber-physical systems comprise with software components and physical objects which are deeply intertwined, each operating on different spatial and temporal scales, exhibiting multiple behavioural modalities and interacting both with each other and with users. They can interact with data and access services using a myriad of ways that change with their context of use. Smart grids, global environmental and disaster monitoring systems, medical and homeland security systems as well as autonomous transportation and automatic pilot avionics are the main applications of cyber-physical systems. These systems are being facilitated by emerging technologies such as the OGC's Sensor Web Enablement (SWE), which is a standard for enabling developers to make sensors and sensor data repositories discoverable and accessible via the Web.

According to researchers, although the infrastructure for communications improves, issues such as how people could interact with these technologies, and how human agency is configured remain largely still unexplored. For example, it becomes difficult for the network and infrastructure engineers to figure out how the end users expect to interact with networked objects (e.g., cars, home appliances) efficiently. Also, it is reported in literature that modelling interaction behaviour with IoT and cyber-physical objects still remains difficult and fundamentally different from human-computer interaction models developed so far. Thus, designing and validating such interactions as well as designing effective user interfaces to improve the usability and usefulness of such devices are particularly challenging.

This special session aims to shed light on aforementioned issue and articulate three main design challenges with humans in the loop: (i) the need for a comprehensive understanding of the complete spectrum of the types of interaction modalities, (ii) the need for extensions to system

identification or other techniques to derive design models from human experiences, and (iii) determining how to incorporate such models into the HCI design methodologies, but also the engineering of the underlying interactions between the physical and software components.

This special track will provide a forum for researchers and user experience designers to share recent research results on the convergence of human-centered design, Cyber-Physical System and IoT, ranging from overviews, proof-of-concepts, modelling interactions, to UI designs.

Topics include, but not limited to:

- HCI design theories and methods and how they apply to cyber-physical systems
- Interaction with networked physical objects with embedded sensors
- Human-data interaction with IoT objects; smart city apps and services; machine-learning algorithms
- Innovative approaches to smart city services design in the context of IoT and cyber-physical systems
- User research and empirical studies on interactions with cyber-physical systems
- Examples of cyber-physical systems and smart services from automotive systems, aerospace systems, digital health information systems, manufacturing and industrial control systems (e.g. smart factory, Industry 4.0), farming and agriculture, energy systems, playable cities
- Novel interaction technology and models for cyber-physical systems
- Interactions and visualization of data in the physical space (e.g. data physicalization)
- Ethical, privacy and usability concerns around interactions between humans and cyber-physical systems

### **Paper Categories**

**Regular Paper** – 7 pages maximum (3 additional pages allowed but at an extra charge)

**Short Paper (Work-in-Progress)** – 6 pages maximum (2 additional pages allowed but at an extra charge)

**Poster** – 5 pages maximum

Regular papers should present novel perspectives within the general scope of the conference. Short papers (Work-in-Progress) are an opportunity to present preliminary or interim results. Posters are intended for ongoing research projects, concrete realizations, or industrial applications/projects presentations.

**Submission:** <https://edas.info/newPaper.php?c=24576&track=92472>

### **Important Dates**

Full Paper Submission: 2nd September 2018

Acceptance Notification: 17th September 2018

Final Paper Submission: 25th September 2018

Presentation Submission: 20th October 2018

Conference: 1st- 3rd November 2018

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