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Call for Papers for a Thematic Issue (TI) on **Sensing, Decision-Making and Economic Impact for Next-Generation Technologies**

Rationale

In today's world, sensing and decision-making play a vital role in shaping the success and growth of next-generation technologies. These technologies have the potential to revolutionize the way we live, work, and communicate, so their impact on society in general, and particularly economically, cannot be ignored. Consequently, this TI aims to gather important contributions on sensing, decision-making, and/or economic impact applied to next-generation technologies, especially those intended to be integrated into Intelligent Environments (IEs).

As is known, IEs are systems characterized by the deployment of a series of hardware devices (such as sensors, processors, actuators, ...) intercommunicated with each other through a network. In addition, they have a logical layer (software), which provides the system with proactivity and intelligence by applying different processing methods and techniques —coming from diverse areas, such as Artificial Intelligence (AI), Software Engineering (SE), and Human-Computer Interaction (HCI), among others— to the data captured by the sensors. In this way, they try to help users in a non-intrusive way. In fact, they can be applied to virtually any facet of everyday life: healthcare, homes and buildings, work, industry, transportation, education, agriculture, art and entertainment, among other application domains.

The first aspect addressed in this TI is *sensing*. Sensing technology has advanced tremendously in recent years, and it is now possible to collect and preprocess large amounts of data in real time, making use of a broad range of sensor devices, such as cameras, microphones, biometric sensors, wearables, etc. The ability to sense and monitor data in real-time has enormous potential for IEs in a wide range of application domains, from smart homes and cities to precision agriculture and healthcare. Therefore, the use of sensors can improve efficiency, reduce costs, and enhance safety in many industries and facets of our daily live.

With the increasing amount of data available, *decision-making* has become a complex and challenging task. For a given IE to be really intelligent, the application of next-generation technologies coming from AI, such as machine learning, neural networks, deep learning, and big data, among others, is becoming essential for making informed decisions. These technologies can analyze large amounts of data, identify patterns, and make predictions. They can also learn and adapt over time, improving their accuracy and effectiveness. In fact, an IE needs to learn what its behaviour should be at all times, so that such behaviour is sensible and appropriate to each of the situations in which it must act to help its users.

Another important aspect to consider is the *economic impact* of next-generation technologies. These are having a significant impact on the economy, since they are helping to create new industries, disrupt existing ones, and change the way we work. This is having implications for job creation, productivity, and competitiveness. Currently, one major challenge is to make IEs affordable and/or a good investment that helps their owners save money in the future. In this sense, and given the high economic cost that the different energy sources are reaching lately, the contribution that these systems can make to optimize energy consumption and do it in a more sustainable way is especially relevant and interesting.

Consequently, the purpose of this TI is to bring together a range of interdisciplinary perspectives on sensing, decision-making and/or economic impact in next-generation technologies. It will highlight the latest research and advancements in these fields, with a focus on how these technologies are shaping the future of our society. More specifically, this TI will compile and present some of the proposals on the application of next-generation technologies to IE engineering that aim to improve both the fundamentals and future developments of this type of systems. Especially welcome will be those that provide solutions, even partial, to one or more of the aforementioned aspects or challenges. Thus, it is hoped that this TI will inspire further research and innovation in these fields and inform policy decisions on the implementation of next-generation technologies.

With all this, we hope this TI provides several benefits to researchers, practitioners, and even policymakers, in various fields. Firstly, it will offer a comprehensive understanding of the role of sensing, decision-making, and economic impact in next-generation technologies. Secondly, it will showcase the latest research and advancements in these fields, highlighting new opportunities and challenges. Thirdly, it will provide case studies and real-world examples of successful implementations of next-generation technologies, as well their application to IEs. Finally, it will identify ethical and social implications of this type of technologies.

Topics

This TI seeks research papers that update the state of the art in the aspects mentioned in the previous section, especially on the following topics, though not limited to them:

- Sensor technologies and their applications
- Deployment of hardware device networks in IEs
- Collecting and smart processing of a large amount of data
- Mobile and wearable computing in IEs
- Data analytics and machine learning for decision-making
- Application of methods and techniques from AI, SE and HCI to IEs
- Personalization/adaptation of functionalities
- User experience design
- Economic impact of next-generation technologies
- Optimization of energy consumption and management
- Sustainability of IEs
- Case studies of successful implementation of next-generation technologies

- Applications of IEs to healthcare and wellbeing, smart homes and buildings, work, industry, transportation, education, agriculture, art and entertainment
- Ethical and social implications of next-generation technologies

Important Dates

Submission Deadline (Full Paper): 30-09-2023

First Review Decision: 15-01-2024

Deadline for Reviewed Manuscripts: 15-03-2024

Final Decision: 15-05-2024

Publication: September 2024

Notes for Authors

- Contributions must be at least 12 pages in length.
- Submitted manuscripts should not have been previously published nor be currently under consideration for publication elsewhere.
- Conference papers may be submitted if the paper has been rewritten and expanded to at least 30% (proofs must be included in the cover letter), and, if appropriate, written permissions must have been obtained from any copyright holders of the original paper.
- For preparation of your manuscript, you may follow the instructions under section “Author Guidelines” at <https://www.iospress.com/catalog/journals/journal-of-ambient-intelligence-and-smart-environments>.
- When submitting the manuscript, authors should indicate the title of this Thematic Issue in the cover letter.

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