

## **Editorial: Special issue on Internet of Things: convergence of sensing, networking, and web technologies**

Antonio Puliafito, Nathalie Mitton, Symeon Papavassiliou, Kishor Trivedi

### **► To cite this version:**

Antonio Puliafito, Nathalie Mitton, Symeon Papavassiliou, Kishor Trivedi. Editorial: Special issue on Internet of Things: convergence of sensing, networking, and web technologies. EURASIP Journal on Wireless Communications and Networking, SpringerOpen, 2012, 2012 (1), pp.212. 10.1186/1687-1499-2012-212 . hal-00784399

**HAL Id: hal-00784399**

**<https://hal.inria.fr/hal-00784399>**

Submitted on 4 Feb 2013

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

EDITORIAL

Open Access

# Editorial: Special issue on Internet of Things: convergence of sensing, networking, and web technologies

Antonio Puliafito<sup>1\*</sup>, Nathalie Mitton<sup>2</sup>, Symeon Papavassiliou<sup>3</sup> and Kishor S Trivedi<sup>4</sup>

Internet is quickly progressing toward the seamless interaction of objects, sensors, and computing devices, usually indicated as the Internet of Things (IoT). Several examples exist where wireless sensor networks, mobile equipments, RFID tags, home appliances, cars, and many other daily objects talk to each other, exchange information, generate aggregated knowledge, and allow to quickly develop new advanced services for the final user. A comprehensive reference scenario is smart grids, i.e., electricity networks that can intelligently integrate the behavior and actions of all objects connected in order to efficiently deliver sustainable, economic, and secure electricity supplies using a two-way digital communication technology. The IoT requires powerful networking environments on one side and sophisticated data aggregation and processing technologies on the other. As sensing technologies perceive the world without human intervention, the amount of generated data is far beyond the one we are used to, where operators traditionally provide input data. Thus, the IoT is becoming a unifying concept where sensing, computing, and web technologies converge, interact, and integrate each other.

For IoT to become a reality, several technical, social, and economical problems still need to be addressed. This Special Issue of the *EURASIP Journal on Wireless Communications and Networking* highlights some of the emerging issues in IoT and associated systems, along with their applicability in an innovative and insightful way.

The papers in this Special Issue are organized into three thematic groups. The first set of four papers focuses on frameworks and architectures for realizing various aspects of IoT, ranging from device interoperability issues, to service composition methodologies and user-

interaction models for IoT, as well as efficiently combining different underlying technologies for building next generation services. Specifically, in “Mashing Up the Internet of Things: A Framework for Smart Environments” [1], a framework and an user-interaction model for IoT applications are introduced toward addressing the following key questions: how data and functionality provided by services on smart environments can be modeled in order to facilitate abstraction and composition, and second, how users are intended to interact with the environments in order to make applications support their particular needs. In “P2P and Grid Computing: Opportunity for Building Next Generation Wireless Multimedia Digital Library” [2], a framework for wireless multimedia digital library is designed, by adopting peer-to-peer overlay networking technology to address the storage space problem and by using grid computing approach to maintain security. In “A Web-based Two-layered Integration Framework for Smart Devices” [3], a web-based framework is provided that enables smart devices to integrate with each other via light-weight interfaces and other back-end applications into agile business process, while a real-life use case on elderly care is studied in detail based on this framework. Finally, in “Combining Cloud and sensors in a smart city environment” [4], concepts and principles from cloud computing and sensing are efficiently combined and integrated to facilitate the design of a pervasive infrastructure, where new generation services interact with the surrounding environment, thus creating new opportunities for contextualization and geo-awareness.

The next set of four papers emphasises on the key role of deploying sensors and sensor networks in the architecture of IoT and associated applications. Specifically, in “Exploiting Sensor Redistribution for Eliminating the Energy Hole Problem in Mobile Sensor Networks” [5], a novel sensor redistribution algorithm is proposed based on the concept of equivalent sensing radius, to deal with

\* Correspondence: [apuliafito@unime.it](mailto:apuliafito@unime.it)

<sup>1</sup>Faculty of Engineering, University of Messina, Contrada di Dio, S. Agata, Messina 98166, Italy

Full list of author information is available at the end of the article

the problem of uneven energy depletion due to the nature of multi-hop communications in sensor networks. In “An Efficient Cluster-Based Power Saving Scheme for Wireless Sensor Networks” [6], the objective is to extend the lifetime of wireless sensor networks by using uniform cluster location and balancing the network loading among the clusters. In “Design and Implementation of a Distributed Fall Detection System Based on Wireless Sensor Networks” [7], the focus is placed on the development and evaluation of feature-specific sensing system to capture spatio-temporal features so as to detect the occurrence of a fall, toward providing pervasive healthcare applications within the framework of IoT. In “A Cluster-Based Proxy Mobile IPv6 for IP-WSNs” [8], the concepts of clustering with the Proxy Mobile IPv6 are combined to deliver an enhanced architecture to tackle problems associated with long handoff latency and non-optimized communication paths in wireless sensor networks.

Finally, the last paper in this special issue deals with the issue of security within IoT framework. Toward addressing this issue the authors of “Internet of Things: Where to Be Is to Trust” [9] propose the adoption of direct peer-to-peer interaction and communities’ creation to grant quick, easy, and secure access to users to surf the web. This way a secure spontaneous ad hoc network is created where access is established through the use of the trust chain generated by nodes.

#### Competing interests

The authors declare that they have no competing interests.

#### Acknowledgments

The guest editorial team members would like to express their appreciation to the authors of all the papers submitted to this special issue. We are also grateful to all the reviewers for their high-quality and timely expert reviews that provided many valuable suggestions to the authors. We would like to further thank Prof. Luc Vandendorpe, Editor-in-Chief, *EURASIP Journal on Wireless Communications and Networking*, as well as the whole Editorial Board for their support. Finally, we owe a debt of gratitude to the whole editorial and publications staff of *EURASIP Journal on Wireless Communications and Networking* that provided us assistance and continuous support throughout the whole process.

#### Author details

<sup>1</sup>Faculty of Engineering, University of Messina, Contrada di Dio, S. Agata, Messina 98166, Italy. <sup>2</sup>Inria Lille - Nord Europe, Villeneuve d'Ascq, France. <sup>3</sup>Department of Electrical and Computer Engineering, National Technical University of Athens, Zografou, Greece. <sup>4</sup>Hudson Professor of Electrical and Computer Engineering, Duke University, Durham, CA, USA.

Received: 11 June 2012 Accepted: 12 June 2012

Published: 9 July 2012

#### References

1. E. Aviles-Lopez, J. Antonio Garcia-Macias, Mashing up the Internet of Things, a framework for smart environments. *EURASIP J Wirel Commun Netw* **2012**, 79 (2012)
2. S. Arulanandam, S. Jaganathan, D. Avula, P2P and grid computing, opportunity for building next generation wireless multimedia digital library. *EURASIP J Wirel Commun Netw* **2012**, 165 (2012)

3. Z. Wu, T. Itala, T. Tang, C. Zhang, Y. Ji, M. Hamalainen, Y. Liu, A web-based two-layered integration framework for smart devices. *EURASIP J Wirel Commun Netw* **2012**, 15 (2012)
4. N. Mitton, S. Papavassiliou, A. Puliafito, K.S. Trivedi, Combining Cloud and sensors in a smart city environment. *EURASIP J Wirel Commun Netw* (2012)
5. J. Jia, X. Wu, J. Chen, X. Wang, Exploiting sensor redistribution for eliminating the energy hole problem in mobile sensor networks. *EURASIP J Wirel Commun Netw* **2012**, 68 (2012)
6. J.-Y. Chang, P.-H. Ju, An efficient cluster-based power saving scheme for wireless sensor networks. *EURASIP J. Wirel. Commun. Netw.* **2012**, 172 (2012)
7. X. Luo, T. Liu, J. Liu, X. Guo, G. Wang, Design and implementation of a distributed fall detection system based on wireless sensor networks. *EURASIP J Wirel Commun Netw* **2012**, 118 (2012)
8. A.J. Jabir, S.K. Subramaniam, Z.Z. Ahmad, N.A.W.A. Hamid, A cluster based proxy mobile IPv6 for IP-WSNs. *EURASIP J Wirel Commun Netw* **2012**, 173 (2012)
9. R. Lacuesta, G. Palacios, C. Cetina, L. Peñalver, J. Lloret, Internet of Things, where to be is to trust. *EURASIP J Wirel Commun Netw* **2012** (2012). in press

doi:10.1186/1687-1499-2012-212

**Cite this article as:** Puliafito et al.: Editorial: Special issue on Internet of Things: convergence of sensing, networking, and web technologies. *EURASIP Journal on Wireless Communications and Networking* 2012 **2012**:212.

**Submit your manuscript to a SpringerOpen<sup>®</sup> journal and benefit from:**

- Convenient online submission
- Rigorous peer review
- Immediate publication on acceptance
- Open access: articles freely available online
- High visibility within the field
- Retaining the copyright to your article

Submit your next manuscript at ► [springeropen.com](http://springeropen.com)