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Call for Papers

Special Issue on The Internet of Things (IoT): Informatics Methods for IoT-enabled Health Care

Deadline for Submission of Manuscripts: January 31, 2017

Recently, significant advancements in the Internet of Things (IoT) have generated extensive opportunities for innovation across both academic and industrial communities, particularly in the health care field [1,2]. Due to the exponential growth of wearable devices and mobile apps, a promising trend is the exploding role of the Internet-of-Things (IoT)—transforming the traditional hubs of healthcare, such as hospitals and clinics, to personalized health care systems, especially in the mobile environment. Current estimates are that over 30% of IoT devices are found in health care [3], and their deployment can potentially drive down costs from clinical and operational inefficiencies by roughly 25% per year. IoT-enabled health care [4,5] is a specific research area that focuses on the utilization of IoT-enabled methods and technologies to offer high quality health services, including faster and safer preventive care, lower overall cost, improved patient-centered practice, and enhanced sustainability.

Current research in IoT-enabled health care is highly interdisciplinary [6–10], involving methodologies from computer science, engineering, information science, behavioral science, decision science, as well as many applied areas in medicine and public health. A promising trend in these studies is the development of sophisticated techniques that will enable:

(i) *Cost-effective wearable biomedical devices.* Yang et al. [6] outline a core set of reporting standards to support the design of novel wearable sensors and sensing platforms for long-term pervasive monitoring of blood pressure, galvanic skin response, electrocardiogram, gait, etc. The perfect design of wearable biomedical sensors is toward zero power, zero drift, zero ambiguity and environmentally independent responses.

(ii) *A highly secured, privacy-protected and trustworthy health care system.* Toval et al. [7] offer a systematic review of important security and privacy issues in delivering IoT-enabled healthcare systems, including compliance, data privacy and integrity, access control and anonymity. Similarly, Gope and Hwang [8] have developed a secure IoT based modern health care system for efficiently accomplishing these needs.

(iii) *The effective and efficient analysis of long-term health data for supporting wise clinical decision-making.* For instance, Pasluosta et al. [9] provide a critical discussion on utilizing IoT enabled technologies for supporting the engagement of Parkinson's disease patients in symptom assessment, diagnosis, and consecutive treatment options. Risso et al. [10] propose a cloud-based mobile system to monitor a patient's life activities at home for improving the service quality of respiratory therapy.

Addressing this trend is challenging due to an array of complicating factors that include:

- the shortage of cost-effective and accurate smart medical sensors
- unstandardized IoT system architectures
- the heterogeneity of connected wearable devices
- the multi-dimensionality and high volume of generated data, and
- the high demand for interoperability.

Additionally, many researchers have recently accepted the assignment of IoT-enabled system architectures into a four-layer organizational structure [11,12]: sensing, networking, data processing and application. It is of great importance to study informatics methods in each layer, seeking ways to empower successfully the utility of IoT enabled technology in healthcare. Such work is associated with issues in the areas of smart sensing technologies [13], network communication [14] and data mining [15]. In the long term, innovative informatics methodologies in IoT-enabled health care will benefit the establishment and enhance the efficiency of (a) practically interoperable IoT systems for care delivery and research, (b) adequate data and knowledge standards of self-empowerment, and (c) sound clinical decision-making foundations.

The goal of this special issue is to bring together researchers and practitioners from both academia and industry and to show state-of-the-art research regarding the development of new informatics methods in IoT-enabled healthcare. The special issue is soliciting original high-quality papers that deal with the development of new and generalizable methodologies and technologies that are relevant to four themes:

(i) smart sensing technologies for IoT-enabled health care
(ii) network communication for IoT-enabled healthcare
(iii) exploration and management of healthcare data derived from IoT devices, and
(iv) innovative IoT healthcare systems and technologies.

The special issue aims to publish original, significant and visionary papers that present ideas, innovations, and motivating applications that use new informatics methods to improve the efficiency, sustainability and reliability of IoT-enabled healthcare systems. Submissions of scientific results from experts in academia and industry worldwide are strongly encouraged. Papers that introduce new applications are not our primary focus; we seek papers that focus on novel methodologies, using a sample application or applications to motivate the work.

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IoT IRAN Internet of Things www.IoTIran.com

Potential topics for contributions to this issue include, but are not limited to, the following areas:

(i) *Smart sensing technologies for IoT enabled healthcare:* Submissions that address issues around the collection, observation and recording of IoT enabled health care information, in an automatic, intelligent, unobtrusive, non-invasive and cost-effective way, are sought.
(ii) *Network communication for IoT enabled healthcare:* Papers that study problems on how to interconnect large-scale heterogeneous network elements and to transmit health care information efficiently in an IoT environment are solicited.
(iii) *IoT healthcare data exploration and management:* We invite articles that concern issues in managing, extracting, analyzing, visualizing and communicating complex and diverse IoT healthcare data and discuss how to convert data into knowledge for clinical decision support and disease management.
(iv) *Innovative IoT healthcare systems and technologies:* Submissions that concentrate on using interdisciplinary knowledge for the design, modelling, development and evaluation of innovative IoT healthcare system framework, architecture and applications.

JBI is particularly interested in publishing methodological reviews on topics relevant to special issues, and we encourage submissions of this type. Note that such reviews should focus on reviewing methods, not specific applications. Questions regarding the topics of the special issue should be directed to Dr. Po Yang at P.Yang@ljmu.ac.uk

Peer-review process

All submitted papers must be original and will undergo a rigorous peer-review process with at least two reviewers. All submissions should follow the guidelines for authors, available at the Journal of Biomedical Informatics web site (http://www.journals.elsevier.com/journal-of-biomedical-informatics). JBI's editorial policy is also outlined on that page (see Aims and Scope) and will be strictly followed by the special issue reviewers.

Submission Guidelines

All submissions should be submitted by January 31, 2017 and formatted in accordance with the Guide for Authors as published in the Journal website at http://www.elsevier.com/journals/journal-of-biomedical-informatics/1532-0464/guide-for-authors. Contributions must not have been previously published or be under consideration for publication elsewhere. A submission based on one or more papers that appeared elsewhere must include major value-added extensions over what appeared previously (at least 30% new material) and should avoid direct copying of text from other publications, even if written by the same authors. Authors are requested to attach to the submitted paper their relevant, previously published articles and a summary document explaining the enhancements made in the journal version, which should also cite the prior work.

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Guest Editors
Po Yang, PhD
Senior Lecturer
Liverpool John Moores University, Liverpool, United Kingdom
E-mail address: P.Yang@ljmu.ac.uk

Oliver Amft, PhD
Professor and Chair of Sensor Technology,
University of Passau, Passau, Germany
E-mail address: Amft@fim.uni-passau.de

Yue Gao, PhD
Senior Lecturer
Queen Mary University of London, London, United Kingdom
E-mail address: Yue.Gao@qmul.ac.uk

Lida Xu, PhD
Eminent Professor
Old Dominion University, Norfolk, Virginia, USA
E-mail address: LXu@odu.edu

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