HAL
open science

Special Issue on Selected Papers from e-Health Pervasive Wireless Applications and Services 2017

Tayeb Lemlouma, Sébastien Laborie, Abderrezak Rachedi, Antonio Santos, Athanasios Vasilakos

To cite this version:

Tayeb Lemlouma, Sébastien Laborie, Abderrezak Rachedi, Antonio Santos, Athanasios Vasilakos. Special Issue on Selected Papers from e-Health Pervasive Wireless Applications and Services 2017. Information, 10 (2), 52 p, 2019. hal-02010362

HAL Id: hal-02010362

https://hal.science/hal-02010362v1

Submitted on 7 Feb 2019

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- Journal of Information,

31 January 2019; Information 2019, 10(2), 52; https://doi.org/10.3390/info10020052

Editorial

Special Issue on Selected Papers from e-Health Pervasive Wireless Applications and Services 2017

Tayeb Lemlouma [1], Sébastien Laborie [2,*], Abderrezak Rachedi [3], António Santos [4] and Athanasios V. Vasilakos [5]

[1] Institut de Recherche en Informatique et Systèmes Aléatoires (IRISA Lab), University of Rennes 1, 35000 Rennes, France; Tayeb.Lemlouma@irisa.fr
[2] Computer Science research laboratory of the University of Pau and Adour countries (LIUPPA Lab), University of Pau and Adour Countries, 64200 Anglet, France
[3] Laboratoire d'Informatique Gaspard-Monge (LIGM Lab), University of Paris-Est Marne la Vallée, 5 Boulevard Descartes, 77420 Champs-sur-Marne, France; rachedi@univ-mlv.fr
[4] Vestas, 4465-334 Leça do Balio, Porto, Portugal; antonio.santos@fraunhofer.pt
[5] Department of Computer Science, Lulea University of Technology, 971 87 Luleå, Sweden; vasilako@ath.forthnet.gr
* Correspondence: sebastien.laborie@iutbayonne.univ-pau.fr

Providing adapted e-health services, applications, and platforms responds to a growing need for medical institutions like hospitals or even homes. Patients with long-term conditions, elderly, and dependent persons need to receive e-health services and assistance in a simple, continuous, and nonintrusive way. When the e-health ecosystem meets the needs of targeted people, and gains their acceptance, provided services help tackle the problems that face the world's population nowadays such as dependency, aging, and healthcare for all. According to the United Nations projections, in 2050, the old-age dependency ratio of the population aged over 65 years will be ~51.70%. This situation points to an issue of developing autonomic healthcare systems and platforms that help people manage their own health with new services and better adapt institutionally based services.

Different standards can be used within the e-health ecosystem hence the network interoperability has to be considered carefully in the design of context-aware applications and services. Heterogeneity is present at different levels, and is still an open issue in e-health systems. In addition to the heterogeneity of patients' profiles and service characteristics, the health environment involves a wide range of required sensors and actuators (e.g., blood pressure and temperature, insulin delivery, appliance control, and presence sensors) that can be sometimes very close to the user like in Body Area Networks (BAN). Sensors usually use different wireless access methods that need to work together and communicate with the rest of the infrastructure (if it exists): gateways, servers, local smart objects, or with the intelligence existing in the medical institution, home, or in the cloud [4]. Due to the strong environmental heterogeneity where e-health services are provided, mechanisms of making autonomic decisions (e.g., diagnostics, continuous monitoring, alerts, and assistance) have to be identified and studied on different levels. For a given service or application, the automatic identification of required sensors and actuators should be ensured and tailored to the context of the person (e.g., health status, mobility, and dependency degree), and the characteristics/constraints of the communication technology and the platform being used.

Other open issues concern the deployment and placement of sensors in the communication architecture. Service deployment should be optimized to guarantee the best network coverage, coordination between sensors and middleware or gateways, possible attachment to the network infrastructure, and delay tolerant networking aspects. Cohabitation of different access methods and communication technologies of sensors and other devices involves sensor/device discovery, network

attachment, and exploitation of the function that a sensor could provide. The heterogeneity of communication technologies used within the same e-health system may negatively affect the performance of the architecture and result in non-optimized network traffic even only in the discovery phase of existing sensors and services. Dealing with the existing heterogeneity should lead to optimal approaches that identify available sensors and devices, available functions provided by the hardware, available services, and their possible composition to match a given context, normalized interfaces required to interact with the different actors in the e-health context-aware ecosystem.

This special issue initiative aims at providing optimal, secure, and context-aware e-health systems with the best quality of services (QoS) and user's experience (QoE). Applications and services are implemented in wireless environments and architecture with the use of IoT (Internet of Things), big data analysis, and a strong heterogeneity of access technologies, sensors, terminals, users' needs analyzers, and services (data, content, live streams, or complex network services). This Special Issue focuses on the latest three contributions of the e-HPWAS 2017 initiative:

The first paper entitled "Remotely Monitoring Cancer-Related Fatigue Using the Smart-Phone: Results of an Observational Study" has been written by Vanessa Christina Klaas, Gerhard Troster, Heinrich Walt, and Josef Jenewein [1]. The authors propose a smartphone-based monitoring system for the complex symptoms of cancer-related fatigue that is not yet explained completely, and there are only a few remedies with proven evidence. Patients do not necessarily follow a treatment plan with regular follow-ups. As a consequence, physicians lack knowledge about how their patients are coping with their fatigue during daily life. To overcome this knowledge gap, the monitoring system is proposed, and the paper shows through an observational study that the proposed monitoring is accepted by patients, and that the system provides additional details about the perceived fatigue and physical activity to a weekly paper-based questionnaire.

The human activity recognition which is increasingly used for medical, surveillance, and entertainment applications is addressed by the second paper entitled "An Ensemble of Condition Based Classifiers for Device Independent Detailed Human Activity Recognition Using Smartphones", by Jayita Saha, Chandreyee Chowdhury, Ishan Roy Chowdhury, Suparna Biswas, and Nauman Aslam [2]. For better monitoring, human activity applications require identification of detailed activity like sitting on chair/floor, brisk/slow walking, running, etc. The authors propose a ubiquitous solution for detailed activity recognition through the use of smartphone sensors. Using smartphones for activity recognition presents some challenges such as device independence and various usage behaviors in terms of where the smartphone is kept. The authors present a detailed activity recognition framework for identifying both static and dynamic activities addressing the above-mentioned challenges.

The third and last paper is entitled "A Blockchain Approach Applied to a Teledermatology Platform in the Sardinian Region" and authored by Katiuscia Mannaro, Gavina Baralla, Andrea Pinna, and Simona Ibba [3]. The authors describe the main points of a teledermatology project that they have implemented to promote and facilitate the diagnosis of skin diseases, and improve the quality of care for rural and remote areas. They detail a blockchain-based approach which aims to add new functionalities to an innovative teledermatology platform developed and tested in the Sardinian Region (Italy). These functionalities include giving the patient a complete access to his/her medical records while preserving security.

To conclude, we would like to thank all authors for their contributions, the reviewers for their help in reading, selecting, and improving the articles' content, and the Journal Editors that allow us to promote the e-HPWAS 2017 contributions.

Conflicts of Interest: The guest editors declare no conflicts of interest.

References

1. Klaas, V.; Troster, G.; Walt, H.; Jenewein, J. Remotely Monitoring Cancer-Related Fatigue Using the Smart-Phone: Results of an Observational Study. *Information* **2018**, *9*(11), 271; doi:10.3390/info9110271.

2. Saha, J.; Chowdhury, C.; Roy Chowdhury, I.; Biswas, S.; Aslam, N. An Ensemble of Condition Based Classifiers for Device Independent Detailed Human Activity Recognition Using Smartphones. *Information* **2018**, *9*(4), 94; doi:10.3390/info9040094.
3. Mannaro, K.; Baralla, G.; Pinna, A.; Ibba, S. A Blockchain Approach Applied to a Teledermatology Platform in the Sardinian Region (Italy). *Information* **2018**, *9*(2), 44; doi:10.3390/info9020044.
4. Mshali, H.; Lemlouma, T.; Moloney, M.; Magoni, D. A Survey on Health Monitoring Systems for Smart Health Homes. *Int. J. Ind. Ergon.* **2018**, *66*, 26–56.