Editorial

Special Section on telemedicine and e-Health communication systems

Recently, telemedicine and e-health activities have produced a large number of successful applications in health care delivery through different communication technologies. Mobile, wireless and fixed communication networks have pushed the deployment of new e-health services, being a very useful and real test bed for the R&D activities applied to communication-based services.

Additionally, the use of nano and micro devices (within Personal and Body Area Networks) and the new wireless standards are requesting new innovative, efficient, interoperable and scalable solutions to make affordable the deployment of e-health systems in a massive manner, with clear benefits for the whole society.

The aim of this Special Section is to present the current status of telemedicine and e-health systems from a communication point of view, paying specific attention to last advances and future trends in this field. Therefore, topics such as standards, security, personal and body area networks, wireless applications, services and future trends have been approached in this Special Section.

Interoperability is a key factor to guarantee the success for the proper implementation and maintenance of telemedicine and e-health systems. Use of standards is the major pillar to assure interoperability as it is shown in ‘Implementation of an End-to-End Standards-based Patient Monitoring Solution’ with ISO/IEEE 11073 (X73) and EN13606. Interoperability from a semantic point of view and an intelligent healthcare monitoring architecture are addressed in ‘SAPHIRE: Intelligent Healthcare Monitoring based on Semantic Interoperability Platform - Pilot Applications’, where the SAPHIRE platform provides the necessary interoperability layers to access the patient’s vital signs from wireless medical sensors and the electronic healthcare records of the patient in order to exploit them in the decision process seamlessly.

Security, understood in a global sense, is also one of the main barriers for the deployment of telemedicine and e-health applications. Identification, digital signature, authorisation, authentication, PKI, roles and privilege issues applied to e-health are addressed in the paper ‘Quality Labels for e-health’.

As clear evidence about where more R&D effort is currently being invested in the telemedicine and e-health area, three papers are presented under the scope of Personal or Body Area Network and mobile health applications: ‘Zigbee-Based Alarm Systems for Pervasive Healthcare in Rural Areas’, that is an alarm system suitable for pervasive healthcare in rural areas. Taking advantage of ZigBee features, users can move freely around their habitual environment while enjoying constant protection. The resulting system is cost-effective, easily deployed (no wiring is needed) and the mobile device’s batteries last for months. Zigbee/IEEE 802.15.4 standard technology and off-the-shelf modules are used for ‘A Body Area Network for patient wireless monitoring’. Therefore, the use of wireless sensors within a Body Area Network (BAN) makes the patient data monitoring task seamless and easy for a proper health and disease management. This BAN is being used for the detection and the prediction of human physiological state in relation to wakefulness, fatigue, and stress applications in which monitored users carry out daily activities in an unobtrusive and comfortable way. Characterised by its low power consumption, low cost, and ability to connect a wide range of heterogeneous sensors, this system can substantially improve the performance of different services, especially those that are health related. The last paper of this serie dealing with Personal/Body Area Networks is ‘Mobile eHealth Monitoring – An Agent-Based Approach’, that presents a multi-agent architecture for mobile health monitoring involving a team of intelligent agents that collate patient data, reason collectively, and recommend actions to patients and medical staff in a mobile environment. Privacy and ethical considerations have also been addressed in these papers.

Moving to more practical focused research, ‘Telemedicine and Tele-Health services for Cancer-care delivery in India’ presents how cancer disease is being approached through IT in India, as this is a major public health problem. Telemedicine provides expert-based health care to understaffed remote sites, advanced emergency care through modern telecommunication and information technologies. Telemedicine helps in prevention, early detection, fast curing, palliative care and rehabilitation in the management of cancer. This article throws light on the status of telemedicine services for cancer care in the Kerala state of India and how telemedicine can be an effective solution of cancer-care delivery in India.

To end this Special Section, the article ‘Ubiquitous Wireless Telemedicine’ provides a general overview on emerging wireless and networking technologies and their use to promote the ultimate goal of global health by means of deployment of a telemedicine paradigm. A state-of-the-art study of recent wireless and medical sensor technologies and an investigation of the continuously growing pressure for a better healthcare service throughout the world has been performed. The study reveals that in spite of available superior technologies services are too expensive, inadequate and cannot respond to the growing demands. Therefore, this paper proposes a flagship solution to make the best use of the next generation of ‘wireless computing’ for building a new harmonised healthcare infrastructure.

We are grateful to authors for their research contributions in this Special Section. Our special thanks go to the Editor In Chief, Professor Habib Rashvand for his support throughout the publication process. We would like to thank all authors who have submitted papers to the Special Section and in particular those whose papers have been published. We also wish to express our gratitude to all reviewers of the papers. Assistance from the editorial staff at the IET, Tony Donegan and Morag Hickman is much appreciated.
Finally, the Guest Editors wish to gratefully acknowledge all those who have generously given their time to review the papers submitted to this Special Section.

We would also like to thank the numerous reviewers for their time spent on formulating their valued comments and feedback that has been fundamental in ensuring the quality of papers selected for publication.

We hope that you enjoy this Special Section.

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