

Editorial

Wireless Telemedicine and Applications

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Telemedicine has become a growing interdisciplinary field. The innovations of information and communications technology are crucial for facilitating reliable, comprehensive, and quality clinical and health care services at a distance. Advances in wireless communications and networking are vital to deliver telemedicine services; however, researchers and practitioners face many great challenges, for example, the failure delivery of a service may end up with loss of human lives. This special issue focuses on the novel and practical ways, but solid contributions, to improve wireless telemedicine and applications.

The call-for-paper of this special issue attracted exciting responses from the research community. As a result, we have received expected number of paper submissions. The submissions covered most aspects of areas of interest. Unfortunately, due to limited space and volume, only seven papers were selected and included in this special issue. In the following, we briefly introduce the seven accepted papers.

Nakamura et al. contributed a paper entitled “Development of long range and high-speed wireless LAN for the transmission of telemedicine from disaster areas” to this special issue. It showcases a development of wireless networks that can provide medical assistance at a distance to residents in mountain areas or the areas where communications infrastructures are damaged in disaster. The network is based on 2.4GHz wireless LAN and the communication range has been extended to more than 30 km with significant engineering efforts and innovations.

The paper entitled “Temperature aware routing for telemedicine applications in embedded biomedical sensor networks” written by Takahashi et al. proposes a temperature-aware routing protocol suitable for wireless body sensor networks. It minimizes temperature arising while maintain-

ing communication channels among sensor nodes; thus, it reduces the damage to the surrounding tissues and extends the life time of the sensor nodes.

In the paper entitled “Activity oriented design of health Pal—a smart phone for elders” healthcare support,” Zao et al. introduce a ubiquitous service infrastructure for elders’ healthcare support and its development approach. This infrastructure adapts an activity-oriented design approach, whose advantages are demonstrated through comparison with similar platforms.

The paper entitled “Adaptive transmission of medical image and video using scalable coding and context-aware wireless medical networks” written by Doukas et al. presents a platform for advanced transmission of medical image and video, introducing context awareness in telemedicine systems where the transmission of medical images and video for telemedicine purposes is optimized.

Challa et al. address secure transmissions of medical and context-aware data from mobile patients to health-care centers over heterogeneous wireless networks in their paper “Secure and efficient data transmission over body sensor and wireless networks.” This paper provides a simple and resource-efficient quality-of-service (QoS) mechanism that is characterized by a packet scheduling and channel/network allocation algorithm over wireless body sensor networks and is capable of collaborating with an adaptive security algorithm.

In the paper entitled “Continuous drug infusion for diabetes therapy: a closed-loop control system design,” Chen et al. design a closed-loop control system for continuous drug infusion in diabetes therapy. The system features a proportional-integral-derivative (PID) and fuzzy logic controllers which can efficiently tackle the control problem for

the resulting highly nonlinear plant. The simulations show that the system has the capability of controlling insulin injection even in the serious disturbance of blood glucose.

Zhen et al. investigate clear channel assessment (CCA) and its impact on the coexistence of IEEE 802.11 HR/DSSS PHY and IEEE 802.15.4b in the 2.4 GHz ISM band 1 in their paper entitled "Clear channel assessment in integrated medical environments." This is a useful issue in an integrated medical environment where the network throughput can suffer significantly due to wrong choice of carrier sensing mechanism. The work may lead to improvement of the integrated environment at protocol level.

In summary, this special issue consists of both theoretical works and practical applications in wireless telemedicine. We are indebted to all the authors who submitted their papers to this special issue. We are very grateful to all the reviewers, whose constructive reviews made the success of this special issue possible and ensured the high quality of this special issue. Finally, we would like to express our gratitude to the previous editor-in-chief of this journal, Dr. Phillip Regalia, and the publisher staff members for their cordial help throughout the publication process of this special issue.

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