Remote Wellbeing Monitoring in 4G Networks

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Abstract:
The impacts of Remote Wellbeing Monitoring (RWM) extend beyond basic lifestyle gains to reach serious humane and economic consequences. The upcoming IMT-Advanced or 4G technologies will empower RWM services with substantial improvements through the use of advances such as multi-carrier access techniques, MIMO, flat architectures, small cells and convergence to all-IP networks. 4G access also promises a “greener” mobile user experience. Deployment of RWM over 4G networks, however, is not without challenges. As a network service, RWM may have stringent constraints in terms of Quality of Service (QoS), reliability and security. The nature of RWM traffic is also mixed (delay-constrained data streams, high resolution images, videos, etc.), and require particular attention from service providers given that lives might be at stake. The tutorial starts with motivating RWM services, offering an up-to-date view of the industry and the market status. It then details the technical requirements of RWM in terms of overall system design, system components, and network considerations. A primer is then provided for IMT-Advanced networks, taking 3GPP’s LTE-Advanced as an example. We review technologies and advances enabling the realization of 4G access networks. Finally, an overview of the research challenges facing dense deployment of RWM services will be given.

Speaker Bios:
Abd-Elhamid M. Taha received his B.Sc. and M.Sc. in Electrical Engineering from Kuwait University, Kuwait in 1999 and 2002, and his Ph.D. from the Department of Electrical and Computer Engineering of Queen’s University, Canada in September 2007. He is currently an

Assistant Professor at Alfaisal University in Saudi Arabia and an Adjunct Assistant Professor at the School of Computing in Queen's University, Canada. Dr. Taha has authored several publications including journals, refereed conference papers, and book chapters. He also served as a technical program committee in several international conferences and symposia. His areas of interest include radio resource management in wireless and mobile networks, especially in the context of wireless overlays with heterogeneous access and wireless relay networks. His recent activity includes co-founding the IEEE Workshop on the Design, Modeling and Evaluation of Cyber Physical Systems (CyPhy'11). Dr. Taha has presented two tutorials before at flagship IEEE conferences including IEEE ICC 2011 and VTC 2010. He is currently a member of both the IEEE and the ACM.

Najah Abu Ali received her B.S. and M.S. degrees in Electrical Engineering from University of Jordan, Amman, Jordan and her PhD degree in 2006 in Computer Networks in Electrical Engineering department at Queen's University, Kingston, Canada. She joined the College of Information Technology, United Arab Emirates University (Al Ain, UAE), as an Associat Professor with the Computer Networks Engineering track. She had a postdoctoral fellowship at the School of Computing, Queen's University from January 2006 to August 2006. Her research interests comprise wired and wireless communication networks. Specifically, analytical and measurement based network performance management and Quality of Service and resource management of single and multihop wireless networks. Dr. Abu Ali is an expert on Broadband Wireless Networks architecture, design, QoS provisioning and performance and has published extensively in the area. She delivered several tutorials before including one on Resource Management in WiMax Networks at ICC 2008, an overview of IEEE 802.16/WiMAX at CCNC 2009, and two on IMT-Advanced standardization and technologies, presented in Globecom 2009 and VTC-Fall 2010.

Hossam Hassanein is a leading authority in the areas of broadband, wireless and mobile networks architecture, protocols, control and performance evaluation. His record spans more than 400 publications in journals, conferences and book chapters, in addition to numerous keynotes and plenary talks in flagship venues. Dr. Hassanein has received several recognition and best papers awards at top international conferences. He is also the founder and director of the Telecommunications Research (TR) Lab at Queen's University School of Computing, with extensive international academic and industrial collaborations. Dr. Hassanein has. He is a senior member of the IEEE, and is currently chair of the IEEE Communication Society Technical Committee on Ad hoc and Sensor Networks (TC AHSN). Dr. Hassanein is an IEEE Communications Society Distinguished Speaker (Distinguished Lecturer 2008-2010).

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