

## Body Area Sensor Network

By

**Dr. Zahoor Ali Khan**  
**Postdoctoral Fellow at Dalhousie  
University**

2013/2014  
**Seminar  
Series**

[www.cs.unb.ca/  
seminarseries](http://www.cs.unb.ca/seminarseries)

Body Area Networks (BAN) is a new generation of wireless monitoring system with the concept of "anytime, anywhere". It has many applications related to a person's health and wellness. BAN can be used in medical centers, emergency services, consumer electronics, health fitness and lifestyle monitoring, defence, entertainment, and personal health applications. Various advanced and valuable state-of-the-art applications of BAN help to enhance the patient's healthcare monitoring and their quality of life. The BAN devices (wearable and implant sensors) are used to monitor the patients' health related concerns such as changes in blood pressure (BP), heart rate, or body temperature and transfer these data to the healthcare center.

BAN communication factors include short range transmission, low data rates, low energy consumption, and non-interference with other electronic/medical devices in addition to the reliable transmission of data with minimal delay. These specific needs of BAN communication are not fulfilled by the existing Personal Area Network (PAN) standards. Recently, a new IEEE standard, 802.15.6, is approved for BAN communication. An automated monitoring of BAN data in a hospital environment is required to address the challenges faced by the healthcare team during the process of collecting and managing delay-sensitive medical information. Different systems based on BAN are proposed to monitor the patient data. Some of the important monitoring systems are ALARM-NET, AID-N, SMART, and CareNet. One of the BAN features is to facilitate the physical mobility of the patient; this means now the patients are not required to stay in the hospital at all times. Routing protocols are required to route a patient's data towards the required destination.

This talk will target a new BAN patient monitoring framework (ZK-BAN) and its associated energy and QoS aware routing protocols. The ZK-BAN provides mechanisms for the real-time display of patient data in an indoor hospital scenario even when the patient is mobile. The ZK-BAN framework helps to reduce network traffic and energy consumption, and improve BAN reliability. More importantly, the ZK-BAN and associated routing protocols have taken into account the IEEE 802.15.6 standard requirements.

Dr. Zahoor Ali Khan is currently working as a Postdoctoral Fellow at Dalhousie University and a visiting Professor of Computing & Information Systems at Saint Mary's University, Halifax, Canada. He received his PhD and MSc degrees from Faculty of Engineering and Faculty of Computer Science at Dalhousie University, respectively. He earned his MSc (Computer Engineering) degree from UET Texila, MSc (Electronics) degree from Quaid-i-Azam University and BSc from University of Peshawar. Dr. Khan has 12+ years of research and development, academia and project management experience in IT and engineering fields. He has multidisciplinary research skills on emerging wireless technologies. His research interests include but are not limited to the areas of e-Health pervasive wireless applications, theoretical and practical applications of Wireless (Body Area) Sensor Networks, and Software Defined Networks. He is interested in designing and implementing the algorithms related to energy and QoS aware routing protocols, fault management, security, privacy, etc. He is (co)-author of a book and 80+ peer-reviewed Journal and Conference papers. Dr. Khan serves as a regular reviewer/organizer of numerous reputed ISI indexed journals, IEEE conferences, and workshops. Dr. Khan is an active member of IEEE, IEEE Communication Society and IAENG.

**Friday, November 29th @ 2:30pm**  
**Information Technology Centre, ITC317**