Huntsville Chapter of the IEEE Computer Society (http://ewh.ieee.org/r3/huntsville/cs/), Department of Electrical and Computer Engineering (http://www.ece.uah.edu/), LaCASA Laboratory (http://www.ece.uah.edu/~lacasa/), and UAH Chapter of Eta Kappa Nu invite you to a research seminar.

Guest Speaker: Chris Otto
Lewis Innovative Technologies (LIT)

Title: Wireless body area networks for ambulatory health monitoring (with prototype demonstration)

Time &Place: 08/25/2006 (Friday), 12:00-13:00, Engineering Building 258, UAH

Abstract

Wireless Body Area Networks (WBANs) represent a promising trend in wearable health monitoring systems. WBANs has potential to revolutionize health monitoring and increase a user's quality of life by offering continuous and ubiquitous ambulatory health monitoring at the least level of obtrusiveness. To explore practicality and identify implementation issues and challenges, we have built a working health monitoring prototype system. The prototype consists of multiple intelligent physiological sensor nodes, a personal health monitoring server, and a network coordinator. The sensor platforms and network coordinator are built from off-the-shelf wireless sensor platforms and feature custom-designed sensor boards for ECG monitoring and motion sensing. The prototype may be used for ambulatory monitoring of patients undergoing cardiac rehabilitation or for monitoring of elderly at home by informal caregivers. Using the prototype system, we have demonstrated the ability to collect physiological data and extract health metrics such as heart rate, heart rate variability, and activity induced energy expenditure. We outline the real-time signal processing for such feature extraction, describe our communication protocol based on standard IEEE 802.15.4 wireless protocol, provide an overview of sensor fusion on the personal server, and describe how this would fit into a broader telemedical system. We also discuss the trade offs system designers must make when optimizing extreme resource constrained systems for ultra low power consumption.

Speaker Biography

Chris A. Otto is a senior design engineer for Lewis Innovative Technologies (LIT). He is a graduate of the University of Alabama in Huntsville, from which he earned a B.S. and M.S. in Computer Engineering. He has over eight years experience in designing hardware and developing software for real-time embedded systems. He has worked for Lewis Innovative Technologies (LIT), Adtran, and TRW. Chris has four pending patents in the field of telecommunications and has spent the last two years doing research in wireless sensor networks for ambulatory health monitoring; published a number of related journal articles and conference papers; as well as a Master's thesis on this subject.