

DEPARTMENT OF ELECTRICAL ENGINEERING PHD DISSERTATION DEFENSE

Noninvasive Electromagnetic Sensor Array for Continuous Monitoring of Human Vital Signs and Assessment of Lung Fluid Content

Speaker: Ruthsenne R.G. Perron
Date: Friday, March 4, 2016
Time: 2:30pm – 4:30pm
Location: Holmes Hall 389

Abstract

Early detection and continuous assessment of lung fluid content or abnormal fluid buildup in the lungs, is the foundation to the management and treatment of life threatening diseases such as heart failure (HF), and other cardiopulmonary related illnesses. However, its use in clinical trials.

Contributions of this dissertation included the following: (1) A textile based sensor for remote monitoring and wearable applications was developed and clinically validated for HR and RR measurements on healthy patients. (2) Specific Absorption Rate (SAR) measurements were conducted with the DASY4 system using safety compliance guidelines set forth by the FCC. With 32 mW input power, the measured SAR was 0.4 W/kg which is only 1/4th of the FCC limit of 1.6 W/kg for 1g avg. (3) HR and RR measurements were clinically validated on ten healthy participants at rest and during exercise. Measured differences between the CPS device and standard hemodynamic devices were all within the limits of agreement which were calculated using Bland-Altman analysis. (4) In colmeasurements also showed significant correlation. (5) Detailed 3D simul