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2013 Undergraduate Research Symposium

Feb 9th, 10:15 AM - 11:15 AM

Innovative Computing in Engineering and Medicine I

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10:15-11:15 AM (Room, 1311)

Innovative Computing in Engineering and Medicine I

**Chairs: Drs. Chung-Hao Chen, Khan Iftekharuddin, & Christian Zemlin,
Department of Electrical and Computer Engineering**

Computer-Controlled Life-Support System for Cardiac Tissue,

By Mostafa Awwad

Cardiac Arrhythmias are a major cause of death. The main tool to find new therapies is experimentation with explanted animal hearts. Data that come from such experiments are reliable only if the hearts are kept in an environment that closely resembles that inside the body. Important environmental parameters are the temperature, flow rate, and pressure of the blood supply, and the temperature of the surrounding fluid. In this project, we developed a system that measures these quantities, automatically acts to keep them within the required ranges, and emits warnings when any quantity cannot be kept within its required range.

Tumor Detection in Mammography Image Analysis

By Michael Chatman

Mammography images are widely used for early detection and prevention of breast cancer. Mammograms are low dose x-rays that are used to mostly examine the breasts of mostly women. The research that we are conducting entails the analysis of vast amount of mammography images to determine if cancerous materials exist in a patient's image or not. The method of our analysis would be by tumor detection and then segmentation. The method of segmentation is done the use of fractal analysis to map where the cancer exists in our indicated region of interest.

The Utilization of Video Face Replacement Technology (VFRT) for Routine Clinical Procedures in Children with Autism Spectrum Disorder (ASD)

By Victor Habgood

Since the prevalence of Autism Spectrum Disorders (ASDs) is on the rise, it is increasingly important to examine ways to help reduce deficits in behavior for children with ASD in clinical settings. Researcher created Video Face-Replacement Technology (VFRT) will consist of a DVD for the child with ASD to view before routine healthcare visits and will incorporate the child and clinical healthcare provider's (- e.g. dental hygienist, nurse, and nurse practitioner) actual face and clinical environment. Unlike current unrealistic commercially created or animated systems, innovative VFRT will imbed the child and CHP's lifelike facial expression, skin pigmentation and head position. Children will be able to view the video prior to the healthcare visit to overcome fear and anxieties leading to inappropriate behaviors in children with ASD within clinical settings.