

Faculty Name:

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Lab:

Ultrasound and Elasticity Imaging Laboratory

Project Title:

Phase-based Electromechanical Wave Imaging of Arrhythmic Heart

Description:

With a prevalence of 1.5% to 5% in the general population [1], heart arrhythmia is a condition in which the heart beats in an irregular pattern that might be caused by (or lead to) heart myopathies and other cardiovascular problems. While both ECG and echocardiograms are used for arrhythmia diagnosis, it is difficult to incorporate the information obtained from both modalities and understand the relationship between the electrical signals and the anatomical features of the heart. Electromechanical wave imaging has been demonstrated to assist the diagnosis of various types of arrhythmias as it maps the activation timings based on strain rates for individual heart beats [2]. Given that the electrical and mechanical activations of the heart are stochastic [3], analysis of individual heart beats, although useful for heart arrhythmia diagnosis, can be further refined by the evaluation of the holistic performance of the heart by considering multiple heart beats and thus further facilitate arrhythmia characterization and treatment design. By assessing the behavior of the heart in the frequency domain, we aim to develop a novel method to characterize heart pathology based on phase shifts in strain rates due to electrical activations.

Location of Research:

Hybrid (both on-site and remote)

of hrs/week:

40

Department/Program:

Biomedical Engineering

Eligibility:

BS, Fourth Year, MS

To apply, please contact:

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