



PRESENTS

### Alex Alvarez

PhD Candidate  
Biomedical Engineering  
PI: Dr. Russel Witte

[Experimental Ultrasound & Neural Imaging Laboratory](#)  
“4D Cardiac Electrical Activation Mapping in Swine”

**ABSTRACT:** Though atrial fibrillation (AF) is a growing public health issue, electrical characterization of the disease has not proceeded past 12-lead electrocardiography (ECG). ECG is inadequate to characterize mechanisms of disease due to poor spatial resolution. This work has been targeted at investigating propagation of the cardiac electrical activation wave in a healthy swine model using acoustoelectric cardiac imaging (ACI). ACI is a noninvasive mapping technology that combines ultrasound with electrical recording to overcome limitations with standard ECG. Real-time 4D ACI with a custom 0.6 MHz matrix ultrasound array demonstrated appropriate propagation of the signal from base to apex and from endocardium to epicardium. This study demonstrated the potential for this technology to noninvasively map arrhythmias, such as AF, with high spatial and temporal resolution.

AND

### Duohua Sun

PhD Candidate  
Biomedical Engineering  
PI: Dr. Nan-kuei Chen

[Chen Lab](#)

“Complex-Valued Spatial-Temporal Super-Resolution Combined with Multi-Band Technique on T2\*-Weighted Dynamic MRI Reconstruction”

**ABSTRACT:** Improvement of MRI resolution is highly desirable for both research and clinical scans. However, the reduction of MRI voxels size results in the increase of data acquisition time and the reduction of signal-to-noise ratio (SNR). As a result, it has been challenging to robustly produce MRI data of both high SNR and high resolution. In this presentation, I will discuss the use of a super-resolution scheme to achieve high-resolution MRI and improve the SNR. The super-resolution scheme enables T2\*-weighted dynamic MRI of high quality and resolution, which is expected to become a valuable tool for neuroscience research.

*Please join us on*

**Monday, October 14<sup>th</sup>, 2019**

12:00-12:50 pm, Keating Bldg., Room 103

Refreshments will be available at 11:50 am

**Hosts:** Drs. DK Kang and Minkyu Kim

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