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"Revolutionizing Image Formation to Improve Clinical Outcomes"

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2:30 pm – 4:00 pm

Denney Research Center (DRB 146)

With the ability to provide real-time information about our complex, dynamic anatomy, ultrasound and photoacoustic images represent two powerful tools to diagnose medical diseases and guide intricate surgeries. However, these tools are limited by the presence of noise artifacts known as acoustic clutter, which are particularly evident when imaging overweight and obese patients. Traditional amplitude-based signal processing methods insufficiently discriminate noise from true signals in these patients who generally produce poor quality images. In this talk, I describe my novel coherence-based beamforming methods, which I initially developed to reduce acoustic clutter in ultrasound images. I then demonstrate how my work translates to photoacoustic imaging to enable novel applications of photoacoustic-guided surgeries with specialized, task-specific light delivery systems that attach to surgical tools. These novel contributions may be integrated with robots to further improve surgical navigation in minimally invasive procedures, expanding the technical envelope of ultrasound and photoacoustic imaging systems, with potential to revolutionize current diagnostic and surgical standards of patient care.

Hosted by: Eun Ji Chung