

# CSDS 500 and ECSE 500 Fall 2021 Colloquium

11:30 AM to 12:30 PM  
Tuesday, November 2, 2021  
Virtual

Zoom Webinar ID: 940 7438 8634  
Passcode: 357363

## Modern Medical Ultrasound Technologies and Emerging Applications

**Abstract:** Biomedical ultrasound has witnessed significant advancement in the past few decades. New fabrication technologies allows miniaturization of array transducers to create new imaging modalities, e.g. wearable and deformable arrays, high channel count volumetric imaging and more. Portable ultrasound powered by artificial intelligence are emerging as valuable tools to democratize healthcare across different domains, boundaries and geographies; all in ways never possible by any other imaging modality.

Parallel computing and advanced processing have revolutionized image formation, enabling several thousand frames per second imaging. This in turn has created a new paradigm in real-time and functional imaging. Therapeutic advances in biomedical ultrasound now allow targeted and controlled intervening in the blood-brain barrier; facilitating delivery of drug vesicles and agents in previously unreachable areas of the brain. Together, these advancements portrair new fronts of the emerging biomedical ultrasound technologies, some of which to be discussed in this seminar.



**Mahdi Bayat, Ph.D.**  
Case Western Reserve University

**Bio:** Mahdi Bayat received the Ph.D. degree in electrical engineering from the University of Minnesota, in 2014. He then joined the Department of Biomedical Engineering and Physiology at Mayo Clinic as a Postdoctoral Research Fellow, where he became a Research Associate, in 2016. He is currently a Research Assistant Professor and an Adjunct Assistant Professor with the Departments of Electrical, Computer and Systems Engineering of Case Western Reserve University. The focus of his research is broadly in signal and data processing for novel imaging methods with applications in diagnostic and therapeutic ultrasound. He is a recipient of the DoD Vision Research Program Investigator Initiated Research grant, a recipient of Clinical and Translational Science Collaborative (CTSC) grant, a co-recipient of Technology Validation and Startup Fund (TVSF), and a co-recipient of Case Coulter Translational Research Partnership (CCTRP) award. He was also a recipient of 2016 American Institute of Ultrasound in Medicine early investigator recognition award. He is an editor in MDPI journal of acoustics, and has served as the organizer and session chair in a number of national and international technical meetings, including 173rd and 175th meetings of the Acoustical Society of America, in 2017 and 2018, respectively.

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