

Ultrasound in Tendons, Blood, and the Brain: Uncovering Clinical Information with Spectral Analysis

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Abstract: Ultrasound is a real-time, non-ionizing medical diagnostic imaging modality ubiquitous in the States. Our laboratory is currently interested in several applications where useful clinical information can be "hiding" from the normal visual response of human observers. Although a fairly conventional engineering tool, spectral analysis is still finding new uses in the increasingly complex physiological world. In this presentation, you will have the opportunity to learn about recent research in 1) the micro-morphology of tendons and how the ultrasound echo pattern can be used to detect and quantitate tissue damage, 2) estimation of blood flow velocity when the target (blood) is moving relative to the scanning device, and 3) estimation of pulsatility and resistive indices in the middle cerebral artery (brain) during periods of rest, exercise, and cognitive tasks as a proxy for functional imaging.