CARNEGIE MELLON UNIVERSITY
BME 2021 SPRING SEMINAR SERIES

Using Advanced Non-Invasive Imaging Techniques to Interpret Brain Structure and Function

PRESENTED BY

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SCHEDULE

Tuesday,
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(12:00 PM-1:00PM)

Severe vascular diseases, like stroke, lead to devastating, life-altering neural effects and frequently can result to loss of life. In critical stroke cases, neuroimaging is required to classify the stroke type and bleeding location to quickly determine the most effective treatment. Currently, functional MRI is the gold standard of hemodynamic imaging for investigating brain activity through changes in the blood flow. Despite significant progress made in disease awareness, detection, and treatment, there are limits in our fundamental understanding of vasculature dysfunction and brain abnormalities due to disease burden making this a vital area for exploration.
In this talk, I will share how ultrahigh field (UHF) MRI techniques have improved the detection of human disease and tissue damage by overcoming the challenges of UHF MRI. Advances in the development of radiofrequency (RF) instrumentation and RF safety assessments has resulted in the visualization of the human brain anatomy up to 100 micrometers. I will discuss how designing a 3D printed phantom contributed to improving RF instrumentation. I will emphasize the importance in using technology to study neural impairments and its associated biomarkers. I will discuss how near infrared light can be used to study and quantify physiological mechanisms that indicate cerebral health. I will conclude why using multi-modal hemodynamic and neural imaging can advance the management of vascular diseases with neural effects and neural disorders.

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