

## From Data to Diagnosis: Al-Powered Imaging for Diverse Brain Health ResearchPresented by Mohamad Habes, PhD Associate Professor, UT Health San Antonio

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Understanding neurodegenerative diseases such as Alzheimer's requires integrating advanced imaging with robust computational tools that can scale across diverse populations. In this seminar, I will introduce the research conducted in the Neuroimage Analytics Laboratory (NAL) and the South Texas Alzheimer's Disease Research Center (ADRC), focusing on how we combine structural and molecular brain imaging with artificial intelligence to study pathological aging.

We will discuss novel imaging biomarkers for small vessel disease developed through the VIBRA initiative, our machine learning indices of brain aging and Alzheimer's risk, and how we are building inclusive models through large multiethnic studies. I will also highlight our leadership role in the national RECOVER initiative, standardizing brain MRI protocols across 30+ sites to study the long-term effects of COVID-19 on brain health. Finally, we will examine how ex vivo imaging is being used to validate and refine in vivo findings, strengthening the biological relevance of imaging-based diagnostics.

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