

Development of a novel non-invasive computational method for cerebral aneurysm mechanical behaviors for pre-operative diagnostics

Michael Sacks, Professor, Biomedical Engineering

Abstract: The availability detailed patient specific information on the time-evolving mechanical behaviors of cerebral as a marker of aneurysmal instability will allow creation of a cerebral vascular digital twin. In brief, the initial digital twin will be based on the data and analysis at the time of the first imaging session. Follow up data will then be used to update and improve the digital twin model, allowing for continuously improved diagnosis. In summary, the advantages of my approach include development of a non-invasive clinical imaging to capture in-vivo mechanical strains and mechanical behaviors in cerebral vasculature, combined with a novel computational algorithm for prediction of aneurysm instability. My long-term goal is to develop these methods for improved understanding of cerebral aneurysm formation and treatment.

