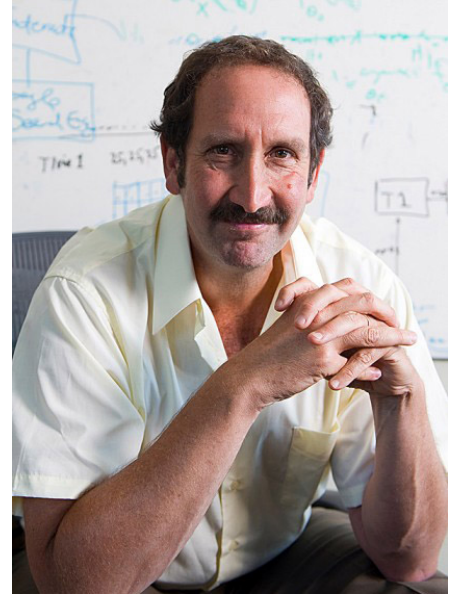


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Computational Anatomy and Diffeomorphometry: Embedding the Brain into the Soft Condensed Matter Continuum

Abstract: I will discuss the central model of computational anatomy, the study of anatomical shapes and form via the group action of diffeomorphisms. We will attempt to show two applications (time permitting), the first using the diffeomorphisms to define a Geodesic Positioning System at the heart of MRICloud, a big-data application for indexing pediatric and geriatric brains, and the second using the diffeomorphisms to study Alzheimer's disease in a population of 360 pre-clinical subjects examined since 1995. We will show (time permitting) how geodesics in the group reveal the generalized Euler-Equation (1755), generalized for compressibility allowing for growth and atrophy.