

ACMS Applied Math Seminar

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154 Hurley Hall

3:30 PM – 4:30 PM



Local Shape Analysis Of Curvature and Thickness In The Cerebral Cortex

Between individuals and across species, brain morphology is strikingly consistent in some significant ways. One example is a characteristic pattern of cortical thickness in gyrencephalic, or folded, brains - thick outer folds, or gyri, and thin inner folds, or sulci. This raises the question: which factors (genetic, biochemical, physical, and/or others) lead to this morphological consistency? In this talk, I will discuss both our models of cortical folding and our analysis of folded cortical geometries. The former includes explorations of both the physical forces generated during folding and heterogeneous cortical growth, and examines the resulting pattern of cortical thickness. The latter includes fully three-dimensional topological analysis of local shape (curvature and depth) and thickness, in humans and several non-human primate species. Through comparisons between our models and imaging data, we can gain a deeper understanding of the factors that contribute to the variable, yet highly characteristic, patterns of thickness throughout the cortex.

The Department of Applied and Computational
Mathematics and Statistics

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