MICHIGAN STATE UNIVERSITY
Department of Statistics and Probability

COLLOQUIUM

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Metric-Based Registration and Analysis of Functional Data

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10:20 a.m. - 11:10 am
Refreshments 10:00 am
C405 Wells Hall

Abstract

Functional data appear in nearly every branch of science, and they encompass a variety of forms, including real-valued function, Euclidean curve, trajectory on nonlinear manifolds and so on. In this talk, I will introduce a comprehensive framework for joint registration and analysis of functional data. This framework uses the Fisher-Rao Riemannian metric to derive a proper distance on the quotient space of functions modulo the time-warping group. A convenient square-root velocity function (SRVF) representation transforms the Fisher-Rao metric into the standard L2 metric, simplifying the computations. This metric leads to efficient algorithms for variation decomposition of functional data, i.e. phase-amplitude separation, and additional computational tools for clustering and statistical modeling of the two components separately. The advantages of this framework are demonstrated using both simulated and real data from different application domains.

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