Inverse Problems Symposium 2025

Name: Hao Zhang Organization: Michigan State University

Abstract Title: Tobler's First Law of Geography and Spatial Correlation

Authors: Hao Zhang

Title: First Law of Geography and Spatial Correlation

Author: Hao Zhang

Abstract: First Law of Geography—"everything is related to everything else, but near things are more related than distant things"—has been extensively cited and discussed in various academic disciplines, including statistics and spatial analysis. It describes a phenomenon that commonly exists for spatial data. Many authors apply it to justify the spatial correlation that seems to exist among the data. In this talk, I will demonstrate that Tobler's Law does not necessarily imply spatial correlation and it may simply describe the relationship of the means at different spatial locations. Subsequently, we could have two different approaches to modeling what Tobler's Law describes through modeling the mean functions and through modeling the spatial correlation. I will explore the differences between the two approaches, which may or may not yield the same solution.