

Indiana University Indianapolis

Department of Mathematical Sciences

STATISTICS SEMINAR

12:15pm—1:15pm, Tuesday, April 22, 2025

Zoom Meeting: Meeting ID: 845 0989 4694

Speaker: **Zhaoxia Yu**

Department of Statistics,

University of California, Irvine

Title: **Advancing Statistical Rigor in Research: The Power of Awareness, Action, and Advocacy**

Abstract:

Ensuring rigor and reproducibility in scientific research is a growing challenge due to the multifaceted nature of scientific research and the increasing complexity of data along with the growth of big data. While the field of statistics has made steady progress with the development of advanced models and computational tools, these methods are often inaccessible to scientific researchers due to the often limited training they received. In this talk, I will share my recent practice of Awareness, Action, and Advocacy (AAA), illustrated through three of my recent works. First, I will discuss a primer article that highlights widespread misuses of statistical methods for clustered data and provides easy-to-follow, open-access resources to address these issues. Second, I will present a robust latent-variable method developed as a valid alternative to the conventional rank-sum test for analyzing clustered data with applications to single-cell omic data. Finally, I will describe a comment letter critiquing a published article in *Nature*, emphasizing the challenge and importance of defending statistical rigor even in high-profile research. Through these examples, I will demonstrate how raising awareness, providing actionable solutions, and advocating for best practices can collectively promote statistical rigor and reproducibility.

Bio:

Dr. Zhaoxia Yu is Professor and Vice Chair for Graduate Studies in Statistics at the University of California, Irvine. She earned her PhD in Statistics from Rice University in 2005 and subsequently completed a two-year position as an Associate Researcher at Mayo Clinic before joining UCI. Her research focuses on developing statistical methods to address challenges in analyzing multivariate and high-dimensional data, with applications across biological, medical, and behavioral sciences. Dr. Yu actively collaborates with geneticists and neuroscientists

at UCI, bridging methodological innovation with real-world scientific questions. She is also a passionate advocate for rigorous statistical practice, offering approachable materials and tools for researchers in various scientific disciplines.