

Applications of optimal transport to non-intersecting paths

Xuan Wu

University of Illinois Urbana-Champaign

Non-intersecting random paths naturally arise in probability theory and mathematical physics, appearing in settings such as level curves of random surfaces and the evolution of eigenvalues of random matrices. Understanding the regularity of these paths is crucial for analyzing their local structures and asymptotic behaviors. Previously, path regularity has been achieved through Gibbs resampling techniques. In this talk, we introduce a novel approach that uses optimal transport to establish path regularity. This method sharpens several previous estimates and also yields new results that were previously inaccessible.

In Special Session 15 on Integrable Probability and KPZ Universality at the Mathematical Congress of the Americas 2025.