

Berkeley Algebraic Statistics Seminar

Organizer(s): Andrew Critch and Shaowei Lin

Wednesday, 2:00–3:00pm, 939 Evans

Oct 19 **Shaowei Lin**, UC Berkeley

Bayesian Statistics and Singular Learning Theory

In Bayesian statistics, probabilities do not represent the actual chance by which events occur, but our *beliefs* about the likelihood of these events, and Bayes' theorem then tells us how observed data should be used to update our beliefs, i.e. *how to learn*.

In this talk, I'll give a brief introduction to Bayesian statistics, and describe how the study of Bayesian integrals opens new grounds in algebraic statistics. Many models of interest in Bayesian statistics have singularities which prevent us from understanding their asymptotic behavior. I will give a summary of how Sumio Watanabe's singular learning theory, as outlined in his book "Algebraic Geometry and Statistical Learning Theory", helps us overcome this problem. His key insight was to apply Hironaka's Resolution of Singularities, a deep result that is well-known in algebraic geometry, to the study of these learning models.