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The Bootstrap for Chaotic Dynamical Systems

Parameter estimation problems in dynamical systems arise naturally in many applications in machine learning, physics, biology, econometrics, and engineering. However, there are several standard statistical techniques that have not yet been implemented in the setting of dynamical systems. One such technique is the Bootstrap which is a widely-used resampling technique assigning measures of accuracy to sample estimates. In this talk, we introduce the Bootstrap for (exponentially mixing) dynamical systems. To establish its asymptotic accuracy, we establish the *continuous* Edgeworth expansions for dynamical systems. We also verify our theoretical results through simulations. This is joint work with Nan Zou (Macquarie University).