



THE UNIVERSITY OF CHICAGO

COMPUTATIONAL AND APPLIED MATHEMATICS STUDENT SEMINAR

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Identifying Linear Dynamical Systems with Stochastic Forcing

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Jones 226, 5747 South Ellis Avenue

ABSTRACT

: In studies of time-dependent phenomena, differential equations models are commonly used and these models must be identified from measurements of the underlying phenomenon. When the underlying phenomenon is deterministic, the identifiability and identification of such models have been studied extensively. However, when the underlying phenomenon is stochastically driven, the identifiability and identification of such models have been studied minimally. In this talk, we present recent progress on the identifiability and identification of linear differential equations with a stochastic forcing process. Specifically, we present a computable, equivalent mathematical characterization of the identifiability of linear dynamical systems with a stochastic forcing process with limited observability of the underlying phenomenon. Then, we present a novel stochastic optimization methodology for robustly identifying such models. In summary, we present a completely mathematical treatment and a novel solver for identifying linear dynamical systems with stochastic forcing