

Abstract Submitted
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Real-Time Reduced Order Modeling Of Deterministic and Stochastic Systems Using Time-Dependent Low-Rank Basis¹ HESSAM BABAEE, MICHAEL DONELLO, University of Pittsburgh — We present a scalable method for the extraction of a time-dependent basis from observations of deterministic/stochastic systems. This method is based on a variational principle whose optimality condition leads to a closed-form evolution equation of the basis. The method is scalable with respect to the size of the data and the reduction order. We will also present real-time reduced order model, which are constructed from projections of the full-dimensional dynamics onto the time-dependent basis. We will present two case studies for the reduced-order modeling of: (1) transient instabilities in Kuramoto-Sivashinsky equation, and (2) transient flow over a bump.

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