

Title: Data-Driven Science and Complex Systems: Challenges and Opportunities.

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A complex system is a system composed of many components which may interact with each other. The prediction of the behavior of complex systems is important in many fields, such as weather forecasting, the motion of the planets, and temporal transitions. Philosophers and scientists have tried to formulate observational models and infer future states of such systems. Complex systems are systems whose behavior is intrinsically difficult to model due to the dependencies, competitions, relationships, or other types of interactions between their parts or between a given system and its environment. Systems that are "complex" have distinct properties that arise from these relationships, such as nonlinearity, emergence, spontaneous order, adaptation, and feedback loops, among others. Our talk focuses on the challenges and opportunities in using information theory and data science in analysis of complex systems.