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Fei Lu, Mauro Maggioni and **Sui Tang***, 3400 North Charles St, Department of Mathematics, Johns Hopkins University, Baltimore, MD 21218. *Learning interaction laws in high dimensional agent dynamics from observations*. Preliminary report.

In different disciplines, inferring the laws of interaction of agents in complex dynamical systems from observational data is a fundamental challenge. We propose a non-parametric statistical learning approach to estimate the governing laws of distance-based interactions, with no reference or assumption about their analytical form, from data consisting trajectories of interacting agents. We demonstrate the effectiveness of our learning approach both by providing theoretical guarantees, and numerical tests on several prototypical systems. (Received August 25, 2018)