

**CRUNCH Seminars at Brown, Division of Applied Mathematics**

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**ODEs learn to walk: ODE-Net based data-driven modeling for crowd dynamics**

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**Predicting the behaviors of pedestrian crowds is of critical importance for a variety of real-world problems. Data driven modeling, which aims to learn the mathematical models from observed data, is a promising tool to construct models that can make accurate predictions of such systems. In this work, we present a data-driven modeling approach based on the ODE-Net framework, for constructing continuous-time models of crowd dynamics. We discuss some challenging issues in applying the ODE-Net method to such problems, which are primarily associated with the dimensionality of the underlying crowd system, and we propose to address these issues by incorporating the social-force concept in the ODE-Net framework. Finally application examples are provided to demonstrate the performance of the proposed method.**