

Forecasting crowd dynamics through coarse-grained data analysis

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Optimizing pedestrian flow efficiency and crowd safety is a critical issue in contemporary urban societies. We advocate the need for "Crowd Weather" forecasting systems using similar concepts as those used in weather forecast. Such a system requires models validated on experimental data. In this talk, we use real time tracking experiments to calibrate a macroscopic model for pedestrian dynamics. It relies on a Bi-directional Fundamental Diagram which relates the pedestrian fluxes to both the co- and counter-moving pedestrian densities. This Bi-directional Macroscopic (BM) model quantitatively reproduces the dynamical observed in the experiments (e.g., clustering, traveling waves). As an application, we use the BM model to determine an optimal segregation strategy that maximize pedestrians fluxes.