

CRUNCH Seminars at Brown, Division of Applied Mathematics

Friday – January 11, 2019

Paper Review: Dynamic response and hydrodynamics of polarized crowds by Nicolas Bain and Denis Bartolo
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Modeling crowd motion is central to situations as diverse as risk prevention in mass events and visual effects rendering in the motion picture industry. The difficulty of performing quantitative measurements in model experiments has limited our ability to model pedestrian flows. We use tens of thousands of road-race participants in starting corrals to elucidate the flowing behavior of polarized crowds by probing its response to boundary motion. We establish that speed information propagates over system-spanning scales through polarized crowds, whereas orientational fluctuations are locally suppressed. Building on these observations, we lay out a hydrodynamic theory of polarized crowds and demonstrate its predictive power. We expect this description of human groups as active continua to provide quantitative guidelines for crowd management.