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REAL-TIME MODELING OF MILLIONS OF PEDESTRIANS

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Abstract. Pedestrian or crowd modeling is of importance for event planning, comfort and hazard/safety assessment, as well as first-responder operations. Computational Crowd Dynamics (CCD) has seen a rapid development over the last two decades, and is used routinely in architecture and civil engineering. Advances in modeling, algorithms and parallelization have allowed real-time simulation and prediction of millions of pedestrians. This in turn can then be used to predict at speeds of 10x real time the movement of hundreds of thousands of pedestrians, something that is of high interest for control and security operations. The talk will summarize progress made over the last year in this area, covering (i) experimental measurements, (ii) automatic wayfinding, (iii) initialization from GIS data, (iv) massively parallel processing, and (v) direct link to CFD codes. Several examples will be shown, including the evacuation of Barcelona.