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Density-Independent Technique for Modeling Self-Propelled Particles PAUL OHMANN, DANIEL SCHUBRING, University of St. Thomas — We present an algorithm for modeling a two-dimensional system of self-propelled particles independent of their density. In this system, we define the nearest neighbors of each particle in terms of a Voronoi tessellation. Specifically, each particle is associated with a region closer to that individual than to any other; we call this region a cell. Neighbors are then defined as those individuals in adjacent cells, no matter their metric distances – and it is these neighbors that influence the subsequent motion of a particle. This density-independent model holds promise in realistically simulating flocking behavior; however, a challenge in developing these simulations is with the efficiency of the updates. We present an algorithm to efficiently update these systems using Delaunay triangulation.

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