



CoCo Seminar Series Fall 2026

Particle Systems with Attitude: On Simulating Emergent Complexity

Jeffrey Ventrella

**Independent Algorithmic Artist, Researcher,
and Author**

**Wednesday September 30, 2026 12:15-
1:15pm EDT**

**Hybrid (EB-T1 & Zoom; meeting link available
on <http://coco.binghamton.edu/>)**



In this presentation I will give an overview of my artificial life research and evolutionary art. In 2016 I invented the Clusters algorithm, which features self-propelled particles. Soon after that I worked on a 3D virtual reality version as a collaboration with Leap Motion. My algorithm inspired the now-popular Particle Life, and other variations. At the 2006 Alife conference I presented research on a particle swarm used to evolve gliders in cellular automata - a study in combining the discrete and the continuous. A common thread throughout this work is the theme of designing emergence, and the principle of crafting minimal rule sets that generate maximal emergent complexity. This design principle is pedagogical, mathematical, and artistic in purpose.

Jeffrey Ventrella (ventrella.com/about) is an algorithmic artist and artificial life researcher. A graduate of the MIT Media Lab where he developed techniques in evolutionary design, Ventrella invented the Clusters particle system (ventrella.com/Clusters) which inspired Particle Life and other variants. He is also the inventor of the GenePool simulation (swimbots.com). Since the mid 90's, Ventrella has presented at alife conferences on evolution of locomotion and morphology. He has written book chapters on evolutionary art, fractal geometry, and cellular automata on geodesic grids. Having worked at the intersections of art, math, and computer science, Ventrella is now on a contract to write a book about the art and math of space-filling fractal curves.

For more information, contact Hiroki Sayama (sayama@binghamton.edu).
<http://coco.binghamton.edu/>