

Keynote speaker:

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“Life as an Emergent Phenomenon:  
Studies from a Large-Scale Boid  
Simulation and Web Data”



A large group with a special structure can become the mother of emergence. We discuss this hypothesis in relation to large-scale boid simulations and web data. In the boid swarm simulations, the nucleation, organization, and collapse dynamics were found to be more diverse in larger flocks than in smaller flocks. In the second analysis, large web data, consisting of shared photos with descriptive tags, tended to group together users with similar tendencies, allowing the network to develop a core-periphery structure. We show that the generation rate of novel tags and their usage frequencies are high in the higher-order cliques. In this case, novelty is not considered to arise randomly; rather, it is generated as a result of a large and structured network. We contextualize these results in terms of adjacent possible theory and as a new way to understand collective intelligence. We argue that excessive information and material flow can become a source of innovation.