

Cellular Automata Networks

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A small-world cellular automaton network has been formulated to simulate the long-range interactions of complex networks using unconventional computing methods in this paper. Conventional cellular automata use local updating rules. The new type of cellular automata networks uses local rules with a fraction of long-range shortcuts derived from the properties of small-world networks. Simulations show that the self-organized criticality emerges naturally in the system for a given probability of shortcuts and transition occurs as the probability increases to some critical value indicating the small-world behaviour of the complex automata networks. Pattern formation of cellular automata networks and the comparison with equation-based reaction-diffusion systems are also discussed

Subjects: **Cellular Automata and Lattice Gases (nlin.CG)**

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