

Cellular Automata and Complex Systems

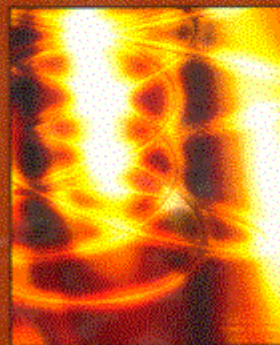
Methods for Modeling Biological Phenomena

Cellular Automata (CA) are a class of spatially and temporally discrete mathematical systems characterized by local interaction and synchronous dynamical evolution, which show complex behavior and are able to model biological phenomena.

Cellular Automata and Complex Systems: Methods for Modeling Biological Phenomena describes the use of cellular automata to provide important insights into a vast range of physical, biological, social, economic and psychological phenomena. This book presents contemporary research on discrete dynamical systems such as one-dimensional and two-dimensional cellular automata and outlines how these systems can be exploited for artistic purposes, translating their mathematical configurations into music and visual media.

Topics Covered:

- Animals and virtual worlds produced by using self-reproducers
- Artificial self-reproducing systems
- Complexity and chaos in the cellular automata
- From the cellular automata to the universal neuron
- Linguistics features and emergent structures
- Genetic algorithms and multi-state cellular automata
- One-dimensional and two-dimensional cellular automata
- Translation of cellular automata into music and visual art
- Von Neumann and the problem of self-replication



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