

Cellular Automaton Tool (CAT)

User Manual

Gesellschaft für Mathematik und Datenverarbeitung

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1. Introduction

The Cellular Automaton Tool (CAT) is a tool to build and visualize cellular automata in an easy-to-use way. Its pascal-like language CARP (**C**ellular **A**utomaton **P**rogramming Language) is a means to build cellular automata of your own or to transfer samples from the literature.

As most intuitive approaches to a cellular automaton, CAT uses the so-called "STATE" window to show the state of each cell of a cellular automaton by a certain color. In most cases, changes of the model may easily be noticed by recognizing uprising patterns or changing colors. Apart from a representation in colors, the state of all cells can also be expressed in decimal or hexadecimal figures.

The high-level programming interface and the visualization capabilities of CAT should make it attractive to learn about the fascinating world of such models of the real world. Equally important, CAT may be taken as a tool to learn about the parallel computing paradigm. Each cell is then taken as a processor that works concurrently with all other cell processors.

Both beginners and experts in the field of cellular automata should start with the "Quick Tour" and execute some sample programs. Later on, experts might continue with the CARP language description. He or she will soon grasp the power and facilities of this language. Beginners should continue by changing some sample programs. Then they may enhance the complexity of their programs and the set of used CARP instructions step by step.

¹Introductions to the theory of cellular automata are T. Toffoli and N. Margolus; Cellular Automata Machines, London (MIT Press) 1988 and S. Wolfram, Universality and Complexity in Cellular Automata. In: Physica 10D (1984).