

Cellular Automata: Simulations Using Matlab

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Abstract—This paper presents a series of implementations of cellular automata rules using the Matlab programming environment. A cellular automaton is a decentralized computing model providing an excellent platform for performing complex computations with the help of only local information. Matlab is a numerical interactive computing environment and a high-level language with users coming from various backgrounds of engineering, science, and economics that enables performing computationally intensive tasks faster than with traditional programming languages (such as C, C++, and Fortran). Our objective has been to investigate and exploit the potential of Matlab, which is simple mathematical programming environment that does not require specific programming skills, regarding the understanding and the efficient simulation of complex patterns, arising in nature and across several scientific fields, captured by simple cellular automata structures. We have implemented several cellular automata rules from the recent literature; herein we present indicative cases of practical interest: the forest fire probabilistic rule, the sand pile rule, the ant rule, the traffic jam rule as well as the well-known "Game of Life". Our work indicates that Matlab is indeed an appropriate environment for developing simulations for cellular automata models.

Keywords—cellular automata; simulation; Matlab.

I. CELLULAR AUTOMATA

A cellular automaton (CA) is an idealization of a physical system in which space and time are discrete and the physical quantities take only a finite set of values. Informally, a cellular automaton is a lattice of cells, each of which may be in a predetermined number of discrete states (a formal definition can be found in [7]). A neighborhood relation is defined over this lattice, indicating for each cell which cells are considered to be its neighbors during state updates. Time is also discrete; in each time step, every cell updates its state using a transition rule that takes as input the states of all cells in its neighborhood (which usually includes the cell itself). All cells in the cellular automaton are synchronously updated. At time $t = 0$ the initial state of the cellular automaton must be defined; then repeated synchronous application of the transition function to all cells in the lattice will lead to the deterministic evolution of the cellular automaton over time. Many variations of this basic model exist; CA can be of arbitrary dimension, although one-dimensional and two-dimensional CA have received special attention in the literature. CA can be infinite or

finite. Finite CA can have periodic boundaries (e.g. the opposite ends of a one-dimensional finite CA are joined together so the whole forms a ring). Updates can be synchronous or asynchronous. Transition rules can be deterministic or stochastic. Many other variations exist; those mentioned above are some of the most typical ones.

The concept of cellular automata was initiated in the early 1950's by John Von Neumann and Stan Ulam [18]. Von Neumann was interested in their use for modelling self-reproduction and showed that a CA can be universal. He devised a CA, each cell of which has a state space of 29 states, and showed that it can execute any computable operation. However, Von Neumann rules, due to their complexity, were never implemented on a computer. Von Neumann's research raised a dichotomy in CA research. On one hand, it was proven that a decentralized machine can be designed to simulate any arbitrary function. On the other hand, this machine (CA) can become as complex as the function it is intended to simulate.

Cellular automata have received extensive academic study into their fundamental characteristics and capabilities and have been applied successfully to the modelling of natural phenomena and complex systems [1], [3], [4], [13], [17], [24], [23]. Based on the theoretical concept of universality, researchers have tried to develop simpler and more practical architectures of CA that can be used to model widely divergent application areas. In the 1970, the mathematician John Conway proposed the (now famous) Game of Life [10], which received widespread interest among researchers. Since the beginning of the 80's, Stephen Wolfram has studied in much detail a family of simple one-dimensional cellular automata rules (known as Wolfram rules [24]) and has showed that even these simplest rules are capable of exhibiting complex behavior. Other applications include, but are not limited to, theoretical biology [2], game theory [19], and non-equilibrium thermodynamics [15].

The rest of the paper is structured as follows: Section II includes a brief description of Matlab as well as main reasons that motivated us for using it in our simulations. Simulations are presented in Section III. Section IV includes conclusion and plans for future work on cellular automata simulations using Matlab.

Cellular Automata Simulations Using Matlab

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Programmable Devices and Systems (PDS 2000) Vilém Srovnal, K. Vlček, 2000 Paperback The IFAC Workshop on Programmable Devices and Systems PDS started in the middle of the nineties in Poland The organisers believe that in the area of programmable devices and systems there are some problems specific to them which sufficiently justifies the decision to organise the PDS 2000 IFAC Workshop The Workshop's main objective is to provide a forum to present the latest research results and experiences in the area of the design and application of programmable devices and systems and a forum to discuss the current status and future trends of this particular branch of the programmable devices in measurement control and computer science **Simulation and Optimization Methods in Risk and Reliability Theory** Pavel Solomonovich Knopov, Panos M. Pardalos, 2009 This book introduces recent advances in the area of risk estimation in complex systems The authors study new methods of accelerated modelling asymptotical analysis and optimal estimating The processes are modelled using large failure trees the methodology of fuzzy sets bayesians methods of stochastic optimisation and optimal

models of equipment service and control The authors suggest applying numerical methods for analysis of super large failure trees having large amount of multiple vertices The methods allow finding minimal sections and reducing the amount of time necessary for such calculations The Bayesian's theory is applied under conditions of uncertainty The methods of finding robust parameter estimates for the most commonly used classes of a priori distribution functions are suggested As an alternative approach to stochastic methods the authors propose the algorithms of critical states estimation for the reactor's active zone that utilise the theory of fuzzy logic *Proceedings of the ... IEEE Conference on Nanotechnology*, 2004

International Aerospace Abstracts, 1999 Second International Workshop on High-Level Parallel Programming Models and Supportive Environments Hermann Hellwagner, 1997 *Proceedings Parallel Computing GIS, Spatial Analysis, and Modeling* David J. Maguire, 2005 A guide for geographic analysts modelers software engineers and GIS professionals this book discusses agent based modeling dynamic feedback and simulation modeling as well as links between models and GIS software This collection also presents a state of the art understanding of applications based on environmental atmospheric hydrological urban social health and economic models *Post-modern Electromagnetics* Christian Hafner, 1999-05-04 Presenting innovative promising and unconventional techniques Post modern Electromagnetics outlines the essential tools for the creation of numerical methods Hafner offers a comparative analysis of the fundamental computational electromagnetics methods and proposes future adaptive strategies Complementary to Max 1 A Visual Electromagnetics Platform this unique text challenges current thinking and provides guidance through the solution of practical problems Features Include Outline of Maxwell theory from simple material properties to complex media and wave equations Discussion of intelligent optimization strategies such as genetic algorithms designed to improve the performance of existing techniques Applications section demonstrating solutions in statics scattering gratings antenna antenna arrays guided waves resonators coupling and waveguide discontinuities Explanation of the background to numerical methods showing how the various approaches to computational electromagnetics can be generalized and combined Students and researchers interested in advanced numerical approaches and design engineers developing new codes for computational electromagnetics will benefit from this exploration of creative electromagnetics solutions **Cancer Bioinformatics** Sylvia Nagl, 2006-03-06 The development and application of bioinformatics tools to basic and translational cancer research is in fact a rapidly expanding field that deserves a timely review Therefore a publication of this type is needed The editors have done an excellent job in recruiting well established scientists to author the various chapters of the book Dieter Naf Jackson Laboratory USA Cancer bioinformatics is now emerging as a new interdisciplinary field which is facilitating an unprecedented synthesis of knowledge arising from the life and clinical sciences This groundbreaking title provides a comprehensive and up to date account of the enormous range of bioinformatics for cancer therapy development from the laboratory to clinical trials It functions as a guide to integrated data exploitation and synergistic knowledge discovery and support the consolidation of the interdisciplinary

research community involved American Scientist ,1996 **Smart Engineering System Design** Cihan H. Dagli,2002
Proceedings of the Artificial Neural Networks in Engineering Conference November 2002 St Louis Missouri This annual
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