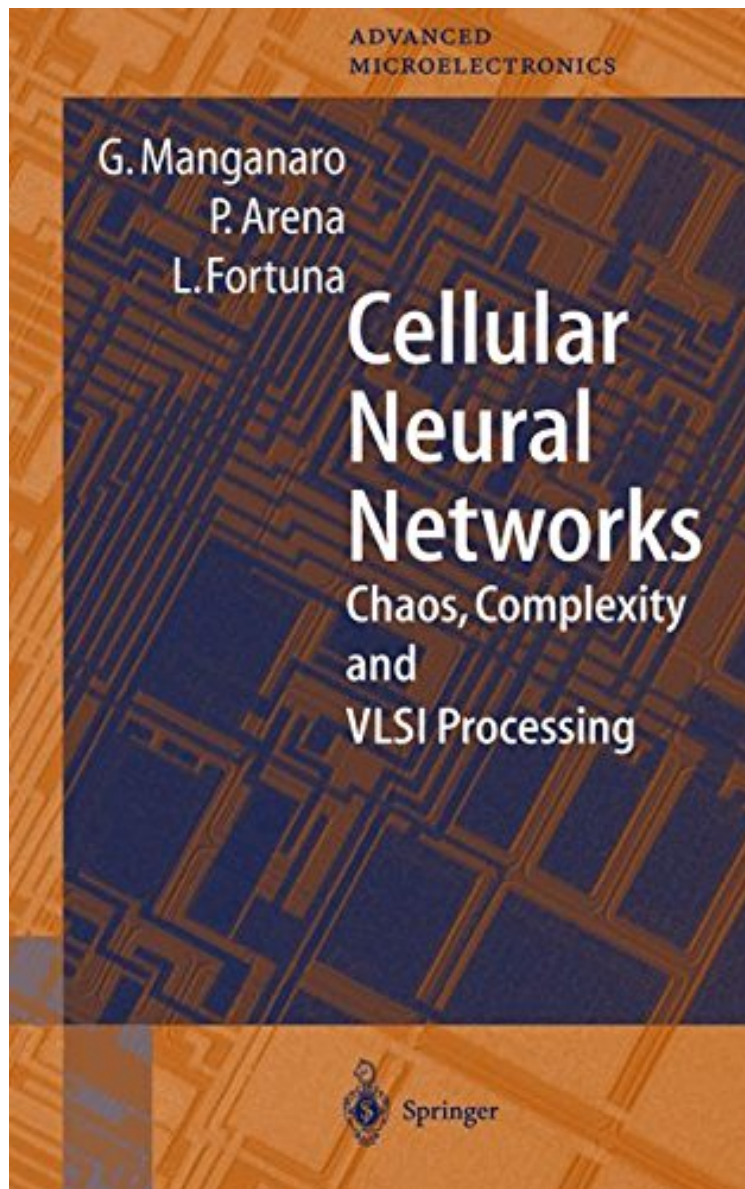


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Cellular Neural Networks: Chaos, Complexity and VLSI Processing (Springer Series in Advanced Microelectronics)

Gabriele Manganaro, P. Arena, L. Fortuna
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Gabriele Manganaro, P. Arena, L. Fortuna : Cellular Neural Networks: Chaos, Complexity and VLSI Processing (Springer Series in Advanced Microelectronics) before purchasing it in order to gage whether or not it would be worth my time, and all praised Cellular Neural Networks: Chaos, Complexity and VLSI Processing

(Springer Series in Advanced Microelectronics):

The field of cellular neural networks (CNNs) is of growing importance in non linear circuits and systems and it is maturing to the point of becoming a new area of study in general nonlinear theory. CNNs emerged through two seminal papers co-authored by Professor Leon O. Chua back in 1988. Since then, the attention that CNNs have attracted in the scientific community has been vast. For instance, there are international workshops dedicated to CNNs and their applications, special issues published in both the International Journal of Circuit Theory and in the IEEE Transactions on Circuits and Systems, and there are also Associate Editors appointed in the latter journal especially for the CNN field. All of this bears witness the importance that CNNs are gaining within the scientific community. Without doubt this book is a primer in the field. Its extensive coverage provides the reader with a very comprehensive view of aspects involved in the theory and applications of cellular neural networks. The authors have done an excellent job merging basic CNN theory, synchronization, spatio temporal phenomena and hardware implementation into eight exquisitely written chapters. Each chapter is thoroughly illustrated with examples and case studies. The result is a book that is not only excellent as a professional reference but also very appealing as a textbook. My view is that students as well professional engineers will find this volume extremely useful.

From the reviews: "The book is divided into eight chapters and each of them guides us through one area where the CNNs can be used . I recommend the publication to everybody, who is interested in the CNN and its application and implementation, but also to those who face some of the technologies described there, such as nonlinear dynamics, synchronization, signal processing or motion control, because the CNN can show a quite novel and beneficial point of view." (Vclav Dekanovsk, Neural Network World, Vol. 15 (5), 2005)From the Back CoverThis book presents a comprehensive description of the emerging technology of cellular neural networks (CNNs), the first general purpose analog microprocessors with applications including real-time image and audio processing, image recognition, and the solution of partial differential equations. It discusses some realistic industrial applications of CNNs (including automatic fruit classification, nuclear magnetic resonance spectra image processing, environmental modeling and simulation for pollution distribution forecast). Particular attention is paid to the study of CNNs in the context of nonlinear circuit theory. Emphasis is also given to chaotic oscillators and their application in secure communication and spread-spectrum systems. Discussed in addition is the subject of spatio-temporal dynamic phenomena in two-dimensional CNNs. It is shown how traveling wavefronts, spirals, and Turing patterns can develop in a regular and topologically simple array. The book is completed by the description of a real CMOS discrete-time switched-current chip implementation of a CNN. The book offers thorough discussions that range from issues at the system-level, which are characterized by a rigorous analytic approach, to the technological and IC design aspects. Examples, simulation studies and experimental results complement the theoretical results throughout.