Self-Organizing Map Formation

Foundations of Neural Computation

Edited by

Klaus Obermayer

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Self-Organizing Map Formation

Computational Neuroscience

Terrence J. Sejnowski and Tomaso A. Poggio, editors

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A Bradford Book

The MIT Press
Cambridge, Massachusetts
London, England

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This book was set in Palatino and printed and bound in the United States of America.

Library of Congress Cataloging-in-Publication Data

Self-organizing map formation : foundations of neural computation / edited by Klaus Obermayer and Terrence J. Sejnowski.
p. cm. — (Computational neuroscience)
"A Bradford Book."
ISBN 0-262-65060-6 (pbk. : alk. paper)
1. Neural computers. 2. Neural networks (Computer science) 3. Self-organizing maps. I. Obermayer, Klaus. II. Sejnowski, Terrence J. (Terrence Joseph) III. Series.
QA76.87 .S46 2001
006.3'2—dc21

2001030329

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Foundations of Neural Computation

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This book provides an overview of self-organizing map formation, including recent developments. Self-organizing maps form a branch of unsupervised learning, which is the study of what can be determined about the statistical properties of input data without explicit feedback from a teacher. The articles are drawn from the journal *Neural Computation*.

The book consists of five sections. The first section looks at attempts to model the organization of cortical maps and at the theory and applications of the related artificial neural network algorithms. The second section analyzes topographic maps and their formation via objective functions. The third section discusses cortical maps of stimulus features. The fourth section discusses self-organizing maps for unsupervised data analysis. The fifth section discusses extensions of self-organizing maps, including two surprising applications of mapping algorithms to standard computer science problems: combinatorial optimization and sorting.

Klaus Obermayer is Professor of Computer Science and head of the Neural Information Processing Group at the Technical University of Berlin.

Terrence J. Sejnowski is Head of the Department of Computational Neurobiology at the Salk Institute of Biological Studies and Professor of Biology at the University of California, San Diego. He is the coeditor of *Unsupervised Learning and Map Formation* (MIT Press, 1999) and of *Neural Codes and Distributed Representation* (MIT Press, 1999) and the Editor-in-Chief of the journal *Neural Computation*.

Computational Neuroscience series
A Bradford Book

The MIT Press
Massachusetts Institute of Technology
Cambridge, Massachusetts 02142
http://mitpress.mit.edu

0-262-65060-6