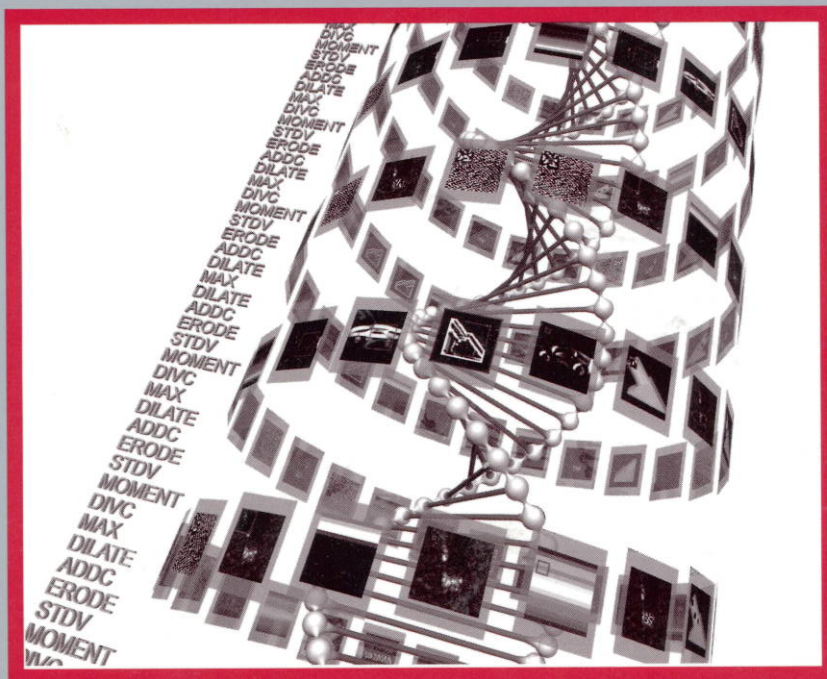



MONOGRAPHS IN COMPUTER SCIENCE

EVOLUTIONARY SYNTHESIS OF PATTERN RECOGNITION SYSTEMS

Bir Bhanu
Yingqiang Lin
Krzysztof Krawiec



 Springer


Designing object detection and recognition systems that work in the real world is a challenging task due to various factors, including the high complexity of the systems, the dynamically changing environment of the real world, and factors such as occlusion, clutter, articulation, and various noise contributions that make the extraction of reliable features quite difficult.

Evolutionary Synthesis of Pattern Recognition Systems presents novel effective approaches based on evolutionary computational techniques, such as genetic programming, linear genetic programming, coevolutionary genetic programming and genetic algorithms, to automate the synthesis and analysis of object detection and recognition systems. The book's concepts, principles, and methodologies will enable readers to automatically build robust and flexible systems—in a systematic manner—that can provide human-competitive performance and reduce the cost of designing and maintaining these systems. Its contents cover all key aspects of object recognition: object detection, feature selection, feature discovery, object recognition, and domain knowledge. Basic knowledge of programming and data structures, and some calculus, is presupposed.

Topics and Features:

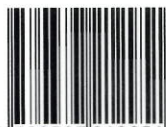
- Presents integrated coverage of object detection/recognition systems
- Describes how new system features can be generated “on the fly,” and how systems can be made flexible and applied to a variety of objects and images
- Demonstrates how object detection and recognition systems can be automatically designed and maintained in a relatively inexpensive way
- Explains automatic synthesis and creation of programs (which saves valuable human and economic resources)
- Focuses on results using real-world imagery, thereby concretizing the book's novel ideas

This accessible monograph provides the computational foundation for evolutionary synthesis involving pattern recognition and is an ideal overview of the latest concepts and technologies. Computer scientists, researchers, and electrical and computer engineers will find the book a comprehensive resource, and it can serve equally well as a text/reference for advanced students and professional self-study.

 Springer

springeronline.com

ISBN 0-387-21295-7



9 780387 212951

Bir Bhanu
Yingqiang Lin
Krzysztof Krawiec

Evolutionary Synthesis of Pattern Recognition Systems

 Springer

Bir Bhanu
Center for Research in
Intelligent Systems
University of California
at Riverside
Bourns Hall RM B232
Riverside, CA 92521

Yingqiang Lin
Center for Research in
Intelligent Systems
University of California
at Riverside
Bourns Hall RM B232
Riverside CA 92521

Krzysztof Krawiec
Center for Research in
Intelligent Systems
University of California
at Riverside
Bourns Hall RM B232
Riverside CA 92521

Series Editors

David Gries
Dept. of Computer Science
Cornell University
Upson Hall
Ithaca NY 14853-7501

Fred B. Schneider
Dept. Computer Science
Cornell University
Upson Hall
Ithaca NY 14853-7501

Library of Congress Cataloging-in-Publication Data
Bhanu, Bir.

Evolutionary Synthesis of Pattern Recognition Systems /Bir Bhanu, Yingqiang Lin, and Krzysztof
Krawiec.
p. cm. -(Monographs in Computer Science)
Includes bibliographic references and index.

ISBN 0-387-21295-7 e-ISBN 0-387-24452-2 Printed on acid-free paper.

© 2005 Springer Science+Business Media, Inc.

All rights reserved. This work may not be translated or copied in whole or in part without the written permission of the publisher (Springer Science+Business Media, Inc., 233 Spring Street, New York, NY 10013, USA), except for brief excerpts in connection with reviews or scholarly analysis. Use in connection with any form of information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed is forbidden.

The use in this publication of trade names, trademarks, service marks and similar terms, even if they are not identified as such, is not to be taken as an expression of opinion as to whether or not they are subject to proprietary rights.

Printed in the United States of America. (BS/DH)

9 8 7 6 5 4 3 2 1 SPIN (HC) 10984741 / SPIN (eBK) 11381136

springeronline.com