

# Lecture Notes in Artificial Intelligence

1778

Subseries of Lecture Notes in Computer Science

Edited by J. G. Carbonell and J. Siekmann

Lecture Notes in Computer Science

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Stefan Wermter Ron Sun (Eds.)

# Hybrid Neural Systems

## Series Editors

Jaime G. Carbonell, Carnegie Mellon University, Pittsburgh, PA, USA  
Jörg Siekmann, University of Saarland, Saarbrücken, Germany

## Volume Editors

Stefan Wermter  
University of Sunderland  
Centre of Informatics, SCET  
St Peters Way, Sunderland, SR6 0DD, UK  
E-mail: stefan.wermter@sunderland.ac.uk

Ron Sun  
University of Missouri-Columbia  
CECS Department  
201 Engineering Building West, Columbia, MO 65211-2060, USA  
E-mail: rsun@cecs.missouri.edu

## Cataloging-in-Publication Data applied for

Die Deutsche Bibliothek - CIP-Einheitsaufnahme

Hybrid neural systems / Stefan Wermter ; Ron Sun (ed.). - Berlin ;  
Heidelberg ; New York ; Barcelona ; Hong Kong ; London ; Milan ;  
Paris ; Singapore ; Tokyo : Springer, 2000

(Lecture notes in computer science ; Vol. 1778 : Lecture notes in  
artificial intelligence)

ISBN 3-540-67305-9

CR Subject Classification (1991): I.2.6, F.1, C.1.3, I.2

ISBN 3-540-67305-9 Springer-Verlag Berlin Heidelberg New York

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© Springer-Verlag Berlin Heidelberg 2000

Printed in Germany

Typesetting: Camera-ready by author data conversion by PTP Berlin, Stefan Sossna  
Printed on acid-free paper SPIN: 10719871 06/3142 5 4 3 2 1 0

# Preface

The aim of this book is to present a broad spectrum of current research in hybrid neural systems, and advance the state of the art in neural networks and artificial intelligence. Hybrid neural systems are computational systems which are based mainly on artificial neural networks but which also allow a symbolic interpretation or interaction with symbolic components.

This book focuses on the following issues related to different types of representation: How does neural representation contribute to the success of hybrid systems? How does symbolic representation supplement neural representation? How can these types of representation be combined? How can we utilize their interaction and synergy? How can we develop neural and hybrid systems for new domains? What are the strengths and weaknesses of hybrid neural techniques? Are current principles and methodologies in hybrid neural systems useful? How can they be extended? What will be the impact of hybrid and neural techniques in the future?

In order to bring together new and different approaches, we organized an international workshop. This workshop on hybrid neural systems, organized by Stefan Wermter and Ron Sun, was held during December 4–5, 1998 in Denver. In this well-attended workshop, 27 papers were presented. Overall, the workshop was wide-ranging in scope, covering the essential aspects and strands of hybrid neural systems research, and successfully addressed many important issues of hybrid neural systems research. The best and most appropriate paper contributions were selected and revised twice. This book contains the best revised papers, some of which are presented as state-of-the-art surveys, to cover the various research areas of the collection.

This selection of contributions is a representative snapshot of the state of the art in current approaches to hybrid neural systems. This is an extremely active area of research that is growing in interest and popularity. We hope that this collection will be stimulating and useful for all those interested in the area of hybrid neural systems.

We would like to thank Garen Arevian, Mark Elshaw, Steve Womble and in particular Christo Panchev, from the Hybrid Intelligent Systems Group of the University of Sunderland for their important help and assistance during the preparations of the book. We would like to thank Alfred Hofmann from Springer for his cooperation. Finally, and most importantly, we thank the contributors to this book.

January 2000

Stefan Wermter  
Ron Sun

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