
EVOLVING INTELLIGENT SYSTEMS

Methodology and Applications

EDITED BY

Plamen Angelov
Dimitar P. Filev
Nikola Kasabov

IEEE Computational Intelligence Society, *Sponsor*



IEEE Press Series on Computational Intelligence
David B. Fogel, Series Editor



IEEE



WILEY

A JOHN WILEY & SONS, INC., PUBLICATION

CONTENTS

PREFACE	vii
1 LEARNING METHODS FOR EVOLVING INTELLIGENT SYSTEMS <i>Ronald R. Yager</i>	1
2 EVOLVING TAKAGI-SUGENO FUZZY SYSTEMS FROM STREAMING DATA (eTS +) <i>Plamen Angelov</i>	21
3 FUZZY MODELS OF EVOLVABLE GRANULARITY <i>Witold Pedrycz</i>	51
4 EVOLVING FUZZY MODELING USING PARTICIPATORY LEARNING <i>E. Lima, M. Hell, R. Ballini, F. Gomide</i>	67
5 TOWARD ROBUST EVOLVING FUZZY SYSTEMS <i>Edwin Lughofer</i>	87
6 BUILDING INTERPRETABLE SYSTEMS IN REAL TIME <i>José V. Ramos, Carlos Pereira, António Dourado</i>	127
7 ONLINE FEATURE EXTRACTION FOR EVOLVING INTELLIGENT SYSTEMS <i>S. Ozawa, S. Pang, N. Kasabov</i>	151
8 STABILITY ANALYSIS FOR AN ONLINE EVOLVING NEURO-FUZZY RECURRENT NETWORK <i>José de Jesús Rubio</i>	173
9 ONLINE IDENTIFICATION OF SELF-ORGANIZING FUZZY NEURAL NETWORKS FOR MODELING TIME-VARYING COMPLEX SYSTEMS <i>G. Prasad, G. Leng, T.M. McGinnity, D. Coyle</i>	201
10 DATA FUSION VIA FISSION FOR THE ANALYSIS OF BRAIN DEATH <i>L. Li, Y. Saito, D. Looney, T. Tanaka, J. Cao, D. Mandic</i>	229
11 SIMILARITY ANALYSIS AND KNOWLEDGE ACQUISITION BY USE OF EVOLVING NEURAL MODELS AND FUZZY DECISION <i>Gancho Vachkov</i>	247

12	AN EXTENDED VERSION OF THE GUSTAFSON-KESSEL ALGORITHM FOR EVOLVING DATA STREAM CLUSTERING	273
	<i>Dimitar Filev, Olga Georgieva</i>	
13	EVOLVING FUZZY CLASSIFICATION OF NONSTATIONARY TIME SERIES	301
	<i>Ye. Bodyanskiy, Ye. Gorshkov, I. Kokshenev, V. Kolodyazhniy</i>	
14	EVOLVING INFERENTIAL SENSORS IN THE CHEMICAL PROCESS INDUSTRY	313
	<i>Plamen Angelov, Arthur Kordon</i>	
15	RECOGNITION OF HUMAN GRASP BY FUZZY MODELING	337
	<i>R. Palm, B. Kadmiry, B. Iliev</i>	
16	EVOLUTIONARY ARCHITECTURE FOR LIFELONG LEARNING AND REAL-TIME OPERATION IN AUTONOMOUS ROBOTS	365
	<i>R. J. Duro, F. Bellas, J. A. Becerra</i>	
17	APPLICATIONS OF EVOLVING INTELLIGENT SYSTEMS TO OIL AND GAS INDUSTRY	401
	<i>José Macías-Hernández, Plamen Angelov</i>	
	Epilogue	423
	About the Editors	425
	About the Contributors	427
	Index	439