

Studies in Fuzziness and Soft Computing

Volume 325

Series editor

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About this Series

The series “Studies in Fuzziness and Soft Computing” contains publications on various topics in the area of soft computing, which include fuzzy sets, rough sets, neural networks, evolutionary computation, probabilistic and evidential reasoning, multi-valued logic, and related fields. The publications within “Studies in Fuzziness and Soft Computing” are primarily monographs and edited volumes. They cover significant recent developments in the field, both of a foundational and applicable character. An important feature of the series is its short publication time and world-wide distribution. This permits a rapid and broad dissemination of research results.

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Towards the Future of Fuzzy Logic

 Springer

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Preface

After the first fifty years from 1965, when Lotfi A. Zadeh published his famous and seminal paper ‘Fuzzy Sets’, an impressive path has been followed for the consolidation of the theories of fuzzy sets and fuzzy logic, as well as for their application to practical problems. In both the theoretical and the applied sides, and mainly in the second, relevant successes have been accomplished. An interesting characteristic shown by the new field, usually known as ‘Fuzzy Logic’, is that its study and practice has been developed in many countries of Europe, Asia, America and Oceania; it can be said that after these fifty years Fuzzy Logic is spread all over the Earth.

It was thanks to Fuzzy Logic that the new field of Soft Computing, in which fuzzy logic has a central role, appeared and developed as a new approach to problems that before the mixing of fuzzy logic with neural nets, genetic algorithms, probabilistic models, etc., could not be satisfactorily posed or solved. Concerning the future of Fuzzy Logic, it seems today that it lies in the new ideas arising from ‘Computing with Words and Perceptions’ (CwW).

Fuzzy logic, Soft computing and CwW were established by Lotfi A. Zadeh, who introduced a good deal of the seminal ideas on which their theoretical and practical development is grounded on. Zadeh, an engineer with a strong personality and of infinite courtesy, is one of the few people in the history of science and technology who, having introduced a new field of research, not only pushed its study and applications, but in his long life personally contemplated them. Today and happily, Zadeh continues seeing how fuzzy logic follows up its strengthening and actual penetration in the welfare of industries and people.

Along the first forty-five years forthcoming 1965, Zadeh traveled through all the continents to explain his new ideas in conferences and meetings. As a consequence of his efforts, many young researchers all over the world were compelled to work in or with fuzzy logic. Thanks to his sweet intellectual form of confronting the adverse opinions that arose from the very beginning of fuzzy set theory, this discipline survived and joined researchers with a nice sense of camaraderie as well as a lack of the typical internal or external academic fights. Fifty years later, there can be no doubt that it was, and it will be thanks to the drive of young researchers that fuzzy

logic can evolve towards the challenging goals posed by CwW in the twenty-first century. Today, when very few people doubt about the importance of fuzziness and on the relevance of its study and applications, new frontiers of knowledge are waiting to be explored. It is for this reason that this book's editors asked their authors to write, from different disciplines and points of view, papers potentially able to motivate young people to devote efforts in the future development of fuzzy logic, fuzzy methodologies, fuzzy applications, etc.

As the editors we thank all authors for their contributions to this volume, for their willingness to write their chapters. We also thank Springer Verlag and in particular Dr. Thomas Ditzinger, Dr. Leontina Di Cecco and Holger Schäpe.

The editors of this book, in their own names and also in those of the authors contributing to it, would like to express their affectionate respect and admiration for Prof. Lotfi A. Zadeh and not only for the man, but also for his work.

Jena, Germany
Mieres, Spain
Warsaw, Poland
February 2015

Rudolf Seising
Enric Trillas
Janusz Kacprzyk

Contents

1	On Reasoning with Words and Perceptions	1
	Pere Julià	
2	Language, Fuzzy Logic, Metalogic	21
	Josep-Maria Terricabras	
3	On What I Still Hope from Fuzzy Logic	31
	Enric Trillas	
4	Fuzzy Logic and Modern Economics	55
	Francesc Trillas	
5	Linguistic Summaries of Time Series: A Powerful and Prospective Tool for Discovering Knowledge on Time Varying Processes and Systems	65
	Janusz Kacprzyk and Sławomir Zadrozny	
6	Granular Geometry	79
	Gwendolin Wilke	
7	Inquiry About the Origin and Abundance of Vague Language: An Issue for the Future	117
	Alejandro Sobrino	
8	Fuzzy Natural Logic: Towards Mathematical Logic of Human Reasoning	137
	Vilém Novák	
9	From Lattice Valued Theories to Lattice Valued Analysis.	167
	Irina Perfilieva and Alexandr Šostak	

10	Applying Fuzzy Mathematics to Empirical Work in Political Science	183
	John N. Mordeson, Terry D. Clark and Mark J. Wierman	
11	Crisis’ Origin’s Causes. Contributions from the Fuzzy Logic in the Sustainability on the Socio-Economic Systems	201
	Anna M. Gil-Lafuente and Alexandra Balvey	
12	Advanced Computing with Words: Status and Challenges	217
	Jerry M. Mendel and Mohammad Reza Rajati	
13	Informal Meditation on Empiricism and Approximation in Fuzzy Logic and Set Theory: Descriptive Normativity, Formal Informality and Objective Subjectivity.	247
	Jordi Cat	
14	Formalizing the Informal, Precisiating the Imprecise: How Fuzzy Logic Can Help Mathematicians and Physicists by Formalizing Their Intuitive Ideas	301
	Olga Kosheleva, Renata Reiser and Vladik Kreinovich	
15	Future Is Where Concepts, Theories and Applications Meet (also in Fuzzy Logic).	323
	Marco Elio Tabacchi and Settimo Termini	
16	Graduated Conjectures	341
	Adolfo Rodríguez de Soto	
17	Fuzzy Concepts and Fuzzy Logic in Historical and Genetic Epistemology	357
	Rudolf Seising	

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