

**Developments in Fuzzy Sets,
Intuitionistic Fuzzy Sets,
Generalized Nets and Related Topics.
Volume I: Foundations**

**Developments in Fuzzy Sets,
Intuitionistic Fuzzy Sets,
Generalized Nets and Related Topics
Volume I: Foundations**

Editors

Editors
Krassimir T. Atanassov
Michał Baczyński
Józef Drewniak
Krassimir T. Atanassov
Janusz Kacprzyk
Michał Baczyński
Maciej Krawczak
Józef Drewniak
Janusz Kacprzyk
Sławomir Zadrozny
Maciej Krawczak
Eulalia Szmidt
Maciej Wygralak
Sławomir Zadrozny

SRI PAS



IBS PAN

**Developments in Fuzzy Sets,
Intuitionistic Fuzzy Sets,
Generalized Nets and Related Topics
Volume I: Foundations**



Systems Research Institute
Polish Academy of Sciences

**Developments in Fuzzy Sets,
Intuitionistic Fuzzy Sets,
Generalized Nets and Related Topics
Volume I: Foundations**

Editors

Krassimir T. Atanassov

Michał Baczyński

Józef Drewniak

Janusz Kacprzyk

Maciej Krawczak

Eulalia Szmidt

Maciej Wygralak

Sławomir Zadrozny

IBS PAN



SRI PAS

© **Copyright by Systems Research Institute
Polish Academy of Sciences
Warsaw 2010**

All rights reserved. No part of this publication may be reproduced, stored in retrieval system or transmitted in any form, or by any means, electronic, mechanical, photocopying, recording or otherwise, without permission in writing from publisher.

Systems Research Institute
Polish Academy of Sciences
Newelska 6, 01-447 Warsaw, Poland
www.ibspan.waw.pl
ISBN 9788389475299

Contents

<i>Foreword</i>	V
<i>Intuitionistic fuzzy subtractions - $'_{\varepsilon,\eta}$ and $''_{\varepsilon,\eta}$</i>	1
K. T. Atanassov	
<i>Stability conditions for generalized nets</i>	11
K. T. Atanassov, I. M. Stamoova and V. K. Atanassova	
<i>On intuitionistic fuzzy multi-dimensional sets. Part 3</i>	19
K. T. Atanassov, E. Szmidt and J. Kacprzyk	
<i>On intuitionistic fuzzy subtractions - $'_{19}$ and $''_{19}$</i>	27
L. Atanassova	
<i>S-implications in Atanassov's intuitionistic and interval-valued fuzzy set theory revisited</i>	33
M. Baczyński	
<i>A Jensen type inequality for Sugeno integrals with respect to intuitionistic fuzzy measures</i>	43
A. I. Ban	
<i>Generalized inverses for monotonic operations. A survey</i>	53
J. Drewniak	
<i>Connection between balanced fuzzy set and Atanassov intuitionistic fuzzy set</i>	63
P. Drygaś	
<i>Hudetz entropy on IF-events</i>	73
M. Ďurica	

<i>Product of intuitionistic fuzzy groups</i>	87
R. Habaj	
<i>Knowledge from contradiction and inconsistency</i>	95
C. J. Hinde	
<i>Estimation of the relations: preference, equivalence and tolerance on the basis of pairwise comparisons</i>	109
L. Klukowski	
<i>On Fuzzy implications with ordered fuzzy numbers</i>	121
W. Kosiński and D. Wilczyńska-Sztyma	
<i>The individual ergodic theorem on IF events</i>	131
L. Lašová	
<i>Eigen fuzzy vectors for min- * product</i>	141
Z. Matusiewicz	
<i>Properties of interval-valued fuzzy relations and Atanassov operators</i>	153
B. Pečkala	
<i>On the probability theory on the Kôpka D-posets</i>	167
B. Riečan and L. Lašová	
<i>On intuitionistic fuzzy trees</i>	177
A. Shannon, P. Rangasamy, K. Atanassov and P. Chountas	
<i>Representing intuitionistic fuzzy sets as metasets</i>	185
B. Starosta	
<i>On the Hamming-metric-based Hausdorff distance for intuitionistic fuzzy sets and interval-valued fuzzy sets</i>	209
E. Szmidt and J. Kacprzyk	

The papers presented in this Volume 1 constitute a collection of contributions, both of a foundational and applied type, by both well-known experts and young researchers in various fields of broadly perceived intelligent systems.

It may be viewed as a result of fruitful discussions held during the Eighth International Workshop on Intuitionistic Fuzzy Sets and Generalized Nets (IWIFSGN-2009) organized in Warsaw on October 16, 2009 by the Systems Research Institute, Polish Academy of Sciences, in Warsaw, Poland, Centre for Biomedical Engineering, Bulgarian Academy of Sciences in Sofia, Bulgaria, and WIT – Warsaw School of Information Technology in Warsaw, Poland, and co-organized by: the Matej Bel University, Banska Bistrica, Slovakia, Universidad Publica de Navarra, Pamplona, Spain, Universidade de Tras-Os-Montes e Alto Douro, Vila Real, Portugal, and the University of Westminster, Harrow, UK:

<http://www.ibspan.waw.pl/ifs2009>

The Eighth International Workshop on Intuitionistic Fuzzy Sets and Generalized Nets (IWIFSGN-2009) has been meant to commence a new series of scientific events primarily focused on new developments in foundations and applications of intuitionistic fuzzy sets and generalized nets pioneered by Professor Krassimir T. Atanassov. Moreover, other topics related to broadly perceived representation and processing of uncertain and imprecise information and intelligent systems are discussed.

We hope that a collection of main contributions presented at the Workshop, completed with many papers by leading experts who have not been able to participate, will provide a source of much needed information on recent trends in the topics considered.

ISBN-13 9788389475299
ISBN 838947529-4



9788389475299