



I T H E A



International Journal
INFORMATION **MODELS**
&
ANALYSES



2013 **Volume 2** **Number 3**



**International Journal
INFORMATION MODELS & ANALYSES
Volume 2 / 2013, Number 3**

Editor in chief: **Krassimir Markov** (Bulgaria)

Adil Timofeev	(Russia)	Levon Aslanyan	(Armenia)
Albert Voronin	(Ukraine)	Luis Fernando de Mingo	(Spain)
Aleksey Voloshin	(Ukraine)	Liudmila Cheremisinova	(Belarus)
Alexander Palagin	(Ukraine)	Lyudmila Lyadova	(Russia)
Alexey Petrovskiy	(Russia)	Martin P. Mintchev	(Canada)
Alfredo Milani	(Italy)	Nataliia Kussul	(Ukraine)
Anatoliy Krissilov	(Ukraine)	Natalia Ivanova	(Russia)
Avram Eskenazi	(Bulgaria)	Natalia Pankratova	(Ukraine)
Boris Tsankov	(Bulgaria)	Nelly Maneva	(Bulgaria)
Boris Sokolov	(Russia)	Olga Nevzorova	(Russia)
Diana Bogdanova	(Russia)	Orly Yadid-Pecht	(Israel)
Ekaterina Detcheva	(Bulgaria)	Pedro Marijuan	(Spain)
Ekaterina Solovyova	(Ukraine)	Rafael Yusupov	(Russia)
Evgeniy Bodyansky	(Ukraine)	Sergey Krivii	(Ukraine)
Galyna Gayvoronska	(Ukraine)	Stoyan Poryazov	(Bulgaria)
Galina Setlac	(Poland)	Tatyana Gavrilova	(Russia)
George Totkov	(Bulgaria)	Valeria Gribova	(Russia)
Gurgen Khachatryan	(Armenia)	Vasil Sgurev	(Bulgaria)
Hasmik Sahakyan	(Armenia)	Vitalii Velychko	(Ukraine)
Iliia Mitov	(Bulgaria)	Vladimir Donchenko	(Ukraine)
Juan Castellanos	(Spain)	Vladimir Ryazanov	(Russia)
Koen Vanhoof	(Belgium)	Yordan Tabov	(Bulgaria)
Krassimira B. Ivanova	(Bulgaria)	Yuriy Zaichenko	(Ukraine)

IJ IMA is official publisher of the scientific papers of the members of
the **ITHEA® International Scientific Society**

IJ IMA rules for preparing the manuscripts are compulsory.

The **rules for the papers** for ITHEA International Journals are given on www.ithea.org.

The camera-ready copy of the paper should be received by ITHEA® Submission system <http://ij.ithea.org>.

Responsibility for papers published in IJ IMA belongs to authors.

General Sponsor of IJ IMA is the **Consortium FOI Bulgaria** (www.foibg.com).

International Journal "INFORMATION MODELS AND ANALYSES" Vol.2, Number 3, 2013

Edited by the **Institute of Information Theories and Applications FOI ITHEA**, Bulgaria, in collaboration with

Institute of Mathematics and Informatics, BAS, Bulgaria,

V.M.Glushkov Institute of Cybernetics of NAS, Ukraine,

Universidad Politecnica de Madrid, Spain,

Hasselt University, Belgium

Institute of Informatics Problems of the RAS, Russia,

St. Petersburg Institute of Informatics, RAS, Russia

Institute for Informatics and Automation Problems, NAS of the Republic of Armenia,

and Federation of the Scientific - Engineering Unions /FNITS/ (Bulgaria).

Publisher: **ITHEA®**

Sofia, 1000, P.O.B. 775, Bulgaria. www.ithea.org, e-mail: info@foibg.com

Technical editor: **Ina Markova**

Printed in Bulgaria

Copyright © 2012-2013 All rights reserved for the publisher and all authors.

© 2012-2013 "Information Models and Analyses" is a trademark of Krassimir Markov

© ITHEA is a registered trade mark of FOI-Commerce Co.

ISSN 1314-6416 (printed)

ISSN 1314-6424 (CD)

ISSN 1314-6432 (Online)