



I T H E A



International Journal

INFORMATION TECHNOLOGIES
&
KNOWLEDGE



2011 Volume 5 Number 3



International Journal
INFORMATION TECHNOLOGIES & KNOWLEDGE
Volume 5 / 2011, Number 3

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

Victor Gladun (Ukraine)

Abdelmgeid Amin Ali	(Egypt)	Koen Vanhoof	(Belgium)
Adil Timofeev	(Russia)	Larissa Zaynutdinova	(Russia)
Aleksey Voloshin	(Ukraine)	Laura Ciocoiu	(Romania)
Alexander Kuzemin	(Ukraine)	Luis F. de Mingo	(Spain)
Alexander Lounev	(Russia)	Natalia Ivanova	(Russia)
Alexander Palagin	(Ukraine)	Nataliia Kussul	(Ukraine)
Alexey Petrovskiy	(Russia)	Nelly Maneva	(Bulgaria)
Alfredo Milani	(Italy)	Nikolay Lyutov	(Bulgaria)
Avram Eskenazi	(Bulgaria)	Orly Yadid-Pecht	(Israel)
Axel Lehmann	(Germany)	Radoslav Pavlov	(Bulgaria)
Darina Dicheva	(USA)	Rafael Yusupov	(Russia)
Ekaterina Solovyova	(Ukraine)	Rumyana Kirkova	(Bulgaria)
Eugene Nickolov	(Bulgaria)	Stefan Dodunekov	(Bulgaria)
George Totkov	(Bulgaria)	Stoyan Poryazov	(Bulgaria)
Hasmik Sahakyan	(Armenia)	Tatyana Gavrilova	(Russia)
Iliia Mitov	(Bulgaria)	Vadim Vagin	(Russia)
Irina Petrova	(Russia)	Vasil Sgurev	(Bulgaria)
Ivan Popchev	(Bulgaria)	Velina Slavova	(Bulgaria)
Jeanne Schreurs	(Belgium)	Vitaliy Lozovskiy	(Ukraine)
Juan Castellanos	(Spain)	Vladimir Ryazanov	(Russia)
Julita Vassileva	(Canada)	Martin P. Mintchev	(Canada)
Karola Witschurke	(Germany)	Zhili Sun	(UK)

International Journal "INFORMATION TECHNOLOGIES & KNOWLEDGE" (IJ ITK)
 is official publisher of the scientific papers of the members of
 the **ITHEA International Scientific Society**

IJ ITK rules for preparing the manuscripts are compulsory.

The rules for the papers for IJ ITK as well as the **subscription fees** are given on www.foibg.com.

Responsibility for papers published in IJ ITK belongs to authors.

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

International Journal "INFORMATION TECHNOLOGIES & KNOWLEDGE" Vol.5, Number 3, 2011

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 Politécnic de Madrid, Spain.

Publisher **ITHEA**[®]

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

Printed in Bulgaria

Copyright © 2011 All rights reserved for the publisher and all authors.

© 2007-2011 "Information Technologies and Knowledge" is a trademark of Krassimir Markov

ISSN 1313-0455 (printed)

ISSN 1313-048X (online)

ISSN 1313-0501 (CD/DVD)