



I T H E A



International Journal
INFORMATION THEORIES
&
APPLICATIONS



2017 Volume **24** Number **2**



International Journal
INFORMATION THEORIES & APPLICATIONS
Volume 24 / 2017, Number 2

Editorial board

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

Alberto Arteta (Spain)	Levon Aslanyan (Armenia)
Aleksey Voloshin (Ukraine)	Luis F. de Mingo (Spain)
Alexander Eremeev (Russia)	Lyudmila Lyadova (Russia)
Alexander Kleshchev (Russia)	Martin P. Mintchev (Canada)
Alexander Palagin (Ukraine)	Natalia Bilous (Ukraine)
Alfredo Milani (Italy)	Natalia Pankratova (Ukraine)
Avtandil Silagadze (Georgia)	Rumyana Kirkova (Bulgaria)
Avram Eskenazi (Bulgaria)	Stoyan Poryazov (Bulgaria)
Boris Fedunov (Russia)	Tatyana Gavrilova (Russia)
Constantine Gaindric (Moldavia)	Tea Munjishvili (Georgia)
Elena Chebanyuk (Ukraine)	Teimuraz Beridze (Georgia)
Galina Rybina (Russia)	Valeriya Gribova (Russia)
Giorgi Gaganadze (Georgia)	Vasil Sgurev (Bulgaria)
Hasmik Sahakyan (Armenia)	Vitalii Velychko (Ukraine)
Iliia Mitov (Bulgaria)	Vitaliy Lozovskiy (Ukraine)
Juan Castellanos (Spain)	Vladimir Donchenko (Ukraine)
Koen Vanhoof (Belgium)	Vladimir Jotsov (Bulgaria)
Krassimira B. Ivanova (Bulgaria)	Vladimir Ryazanov (Russia)
Leonid Hulianytskyi (Ukraine)	Yevgeniy Bodyanskiy (Ukraine)

International Journal "INFORMATION THEORIES & APPLICATIONS" (IJ ITA)
is official publisher of the scientific papers of the members of
the ITHEA International Scientific Society

IJ ITA welcomes scientific papers connected with any information theory or its application.

IJ ITA rules for preparing the manuscripts are compulsory.

The rules for the papers for IJ ITA are given on www.ithea.org.

Responsibility for papers published in IJ ITA belongs to authors.

International Journal "INFORMATION THEORIES & APPLICATIONS" Vol. 24, Number 2, 2017

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 Politécnica de Madrid, Spain,

Hasselt University, Belgium,

St. Petersburg Institute of Informatics, RAS, Russia,

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

Printed in Bulgaria

Publisher ITHEA®

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

Technical editor: Ina Markova

Copyright © 2017 All rights reserved for the publisher and all authors.

© 1993-2017 "Information Theories and Applications" is a trademark of ITHEA®

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

ISSN 1310-0513 (printed)

ISSN 1313-0463 (online)