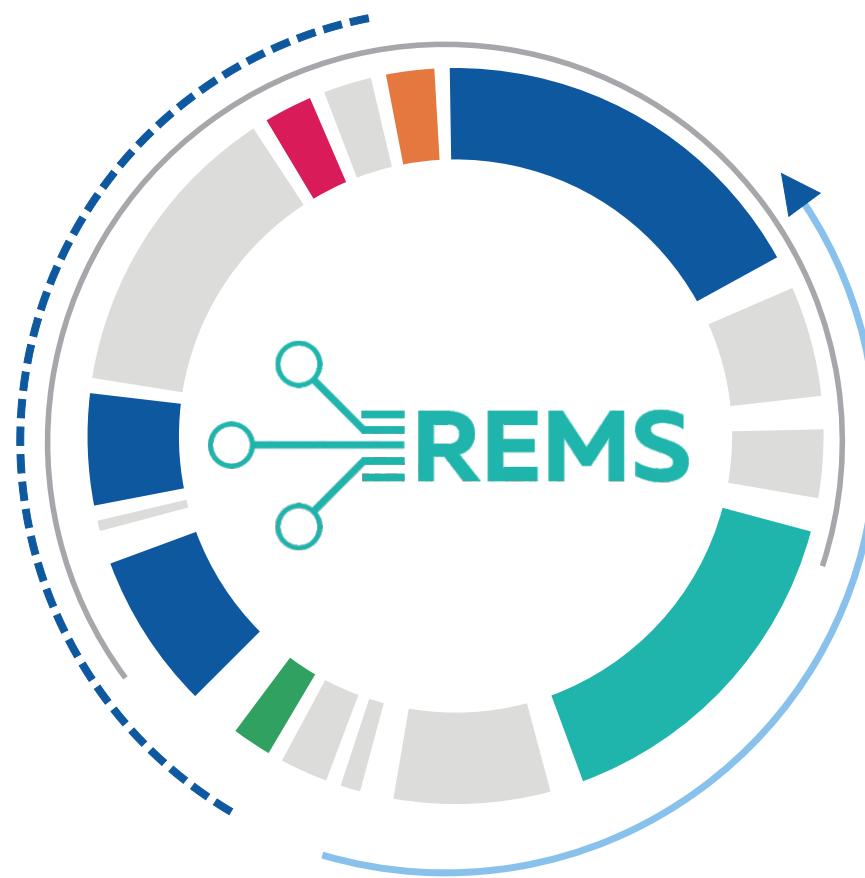


15 - 20 ОКTOBER 2018
STAVROPOL - DOMBAY



INTERNATIONAL MULTIDISCIPLINARY SYMPOSIUM ICT RESEARCH IN RUSSIAN FEDERATION AND EUROPE

"INTEGRATING RESEARCH AGENTS AND DEVISING JOINT CHALLENGES"

REMS-2018



Preface

The *Multidisciplinary Symposium on ICT Research* (REMS 2018) is a symposium dedicated to the exchange of advanced research experiences in the field of Information and Communication Technologies between Russia and western countries under the motto “Integrating Research Agendas and Devising Joint Challenges”.

The symposium attracted 97 contributions of which **12 long papers** and **27 short papers** were accepted for presentation at the symposium.

Additionally, it included 4 invited talks given by Andrew Brodnik, Evgeny Nikolaev, Nafisa Yusupova and Giuseppe Santucci.

We would like to thank all the authors for their submissions, and our Program Committee and additional reviewers for their precious work.

The *Multidisciplinary Symposium on ICT Research* is held with the financial support of the Russian Foundation for Basic Research, project No. 18-07-20081.

October 2018
Roma, Italy
Stavropol, Russia

Marco Schaerf and Massimo Mecella
Sapienza Università di Roma, Italy
Drozdova Victoriya Igorevna and
Kalmykov Igor Anatolievich
North-Caucasian Federal University,
Stavropol, Russia

Program Committee

Sergey Ablameyko	Belarusian State University
Marco Aiello	University of Stuttgart
Tatiana V. Avdeenko	Novosibirsk State Technical University
Maxim Bakaev	Novosibirsk State Technical University
Andrej Brodnik	University of Ljubljana
Maurizio Caon	University of Applied Sciences of Western Switzerland of Fribourg
Dijana Bogatinoska	UIST "St Paul the Apostle" Ohrid
Aleksandr Cariow	West Pomeranian University of Technology
Stanislaw Czapp	Gdansk University of Technology
Massimiliano de Leoni	Eindhoven University of Technology
Lubomir Dimitrov	Technical University of Sofia
Victoriya Drozdova	North Caucasus Federal University
Anna Fensel	University of Innsbruck
Oleg Finko	Kuban State University of Technology
Marco Fratarcangeli	Chalmers University of Technology
Ladislav Huraj	University of SS. Cyril and Methodius in Trnava
Steffen Hölldobler	TU Dresden
Christian Janiesch	University of Wurzburg
Igor Kalmykov	North Caucasus Federal University
Miroslav Kvassay	University of Zilina
Alexander Lazovik	University of Groningen
Vitaly Levashenko	University of Zilina
Jaroslav Majernik	Pavol Jozef Safarik University in Kosice
Reza Malekian	University of Pretoria
Andrei Malikov	North Caucasus Federal University
Federica Mandreoli	Università di Modena e Reggio Emilia
Igor Mandritsa	North Caucasus Federal University
Massimo Mecella	Sapienza Università di Roma
Jan Mendling	Wirtschaftsuniversität Wien
German Michalconok	Slovak University of Technology
Krzysztof Pancerz	University of Rzeszow
Vladimir Pashintsev	North Caucasus Federal University
Peter Peer	University of Ljubljana
Hubert Roth	Siegen University
Abdel-Badeeh Salem	Ain Shams University
Marco Schaefer	Sapienza Università di Roma
Giuzel Shakhmametova	Ufa State Aviation Technical University
Danijel Skocaj	University of Ljubljana
Alexander Sukhinov	Don State Technical University
Pavol Tanuska	Slovak University of Technology
Alexey Tselykh	Southern Federal University
Nafisa Yusupova	Ufa State Aviation Technical University

Elena Zaitseva
Vadim Zhmud

University of Zilina
Novosibirsk State Technical University

Additional Reviewers

Blaauw, Frank
d'Amore, Fabrizio
Fiorini, Laura
Imgrund, Florian
Lazovik, Elena
Martoglia, Riccardo
Medema, Michel
Montangero, Manuela
Pratama, Azkario Rizky
Querzoni, Leonardo
Scafoglieri, Federico
Setz, Brian
Sha, Ang
Wanner, Jonas

Table of Contents

Visualizing the Herlofson's Nomogram	1
<i>Marco Angelini, Tiziana Catarci and Giuseppe Santucci</i>	
Protocols Security Analysis Using Modern Tools Of Verification.....	11
<i>Liudmila Babenko and Ilya Pisarev</i>	
Research of influence of the attacks on the group of mobile wireless network nodes	20
<i>Elena Basan, Oleg Makarevich and Stanislav Teterevyatnikov</i>	
A novel QR-code based watermarking scheme for digital rights.....	29
<i>Fabrizio d'Amore and Stefano Chiavarelli</i>	
Addressing the Tacit Knowledge of a Digital Library System	41
<i>Angela Di Iorio and Marco Schaerf</i>	
Mathematical modelling of the stabilization system for a mobile base video camera using quaternions	51
<i>Alexander Isaev, Anna Adamchuk, Stanislav Amirokov, Mikhail Isaev and Mikhail Grazhdankin</i>	
Quality Management Principles of Scientific and Methodological Support for Students' Activity within E-Learning Environment	63
<i>Valentina N. Kormakova, Alla G. Klepikova, Elena N. Musaelian and Yulia A. Prokopenko</i>	
Evaluation of syllable intelligibility through recognition in speech rehabilitation of cancer patients.....	75
<i>Evgeny Kostyuchenko, Dariya Novokhrestova and Lidiya Balatskaya</i>	
Distributed Management System for Infocommunication Networks Based on TM Forum Frameworx	81
<i>Valeriy Mochalov, Natalia Bratchenko, Sergey Yakovlev and Darya Gosteva</i>	
Determination of the spatial position and orientation of the links of the robot anthropomorphic grip by the solution of the direct and inverse kinematics problem	94
<i>Vyacheslav Petrenko, Fariza Tebueva, Andrew Pavlov, Sergey Ryabtsev and Vladimir Antonov</i>	
The adaptive control system of quadrocopter motion	105
<i>Marco Schaerf, Massimo Mecella, Dmitry Vinokursky and Filipp Samoilov</i>	
Markov Model of Evaluation of Learning Results	114
<i>Vladimir Serbin</i>	
Modeling and visualization of emergency situations at oil storage facilities	123
<i>Elena Abdulina</i>	

High-performance calculations for modeling of processes of transfer of pollution in an atmospheric boundary layer from superficial sources	131
<i>Eugenij Alexeev, Sergey Rychkov and Anatoliy Shatrov</i>	
Two-dimensional control and assurance of data integrity in information systems based on residue number system codes and cryptographic hash functions.....	139
<i>Sergej Dichenko and Oleg Finko</i>	
Development of the Protocol "Electronic Cash" with Inspection Correction Rules of the Electronic E-Cash Number for E-Commerce Systems	147
<i>Igor Kalmykov, Maria Lapina, Natalija Kononova and Maxim Kalmykov</i>	
Simultaneous use of Imitation Learning and Reinforcement Learning in artificial intelligence development for video games	154
<i>Vadim Karavaev, Tatjana Kiseleva and Oksana Orlinskaya</i>	
Entropy-based detection of the words boundaries of continuous speech . . .	162
<i>Andrey Sergeevich Karpov, Victorija Igorevna Drozdova, Galina Shagrova and Aleksey Shevchenko</i>	
Educational Module "Specialist's Integration into the Professional Environment" based on Massive Open Online Courses	168
<i>Irina Krivko, Svetlana Lebedeva, Yulia Manzhosova and Ekaterina Starodubtseva</i>	
Computer Simulation of M2M Communication Subscriber Locating	174
<i>Galina Kurcheeva, George Klochkov and Maxim Bakaev</i>	
Decrease Energy Consumption of Transport Telecommunication Networks Due To the Usage of Stage-By-Stage Controlling Procedure....	181
<i>Gennady Linets, Sergey Melnikov, Svetlana Govorova, Maria Lapina and Viktor Medenec</i>	
Software and hardware infrastructure for timetables scheduling in university	191
<i>Andrey Malikov, Vladimir Voronkin, Aleksey Shchegolev and Svetlana Pevchenko</i>	
Defining a cybersecurity strategy of an organization: criteria, objectives and functions	199
<i>Igor Mandritsa, Anna Fensel, Massimo Mecella, Fariza Tebueva, Victor Peleshenko, Vyacheslav Petrenko, Olga Mandritsa and Irina Solovyova</i>	
Species Trees Forcing the Parsimony to Fail Modelling Evolution Process	206
<i>Vikentij Mikheev and Sergej Miheev</i>	

Development of an intelligent system of complex diagnostics of human bioelement status	214
<i>Sergey Miroshnikov, Irina Bolodurina, Olga Arapova and Denis Parfenov</i>	
The Preparation of a Modern Computer Science Teacher with the Help of Resource-Saving Technologies and Green IT Implementation	222
<i>Olga Pankratova, Ekaterina Konopko, Oksana Mezentseva and Roman Nemkov</i>	
A genetic-algorithm approach for forming individual educational trajectories for listeners of online courses	229
<i>Denis Parfenov, Veronika Zaporozhko and Irina Bolodurina</i>	
Energetic concealment of low-frequency satellite communication system with arbitrary recession of radiointercepting receiver	237
<i>Vladimir Pashintsev, Alexander Chipiga and Ivan Anzin</i>	
The method of the quasioptimal per energy efficiency design of the motion path for the anthropomorphic manipulator in a real time operation mode	245
<i>Vyacheslav Petrenko, Fariza Tebueva, Vladimir Antonov, Mikhail Gurchinsky and Nikolai Untewsky</i>	
Architecture of a Software System for Robotics Control	253
<i>Aleksey Shevchenko, Oksana Mezentseva, Dmitriy Mezentsev and Konstantin Ganshin</i>	
Using neural networks in building a psychological typology	260
<i>Vladimir Solomonov, Elena Fomina, Dmitry Solomonov and Tatiana Banshchikova</i>	
Addressing multi-users open challenge in Habit Mining for a Process Mining based approach	266
<i>Daniele Sora, Massimo Mecella and Francesco Leotta</i>	
SLAM method: reconstruction and modeling of environment with moving objects using an RGBD camera	274
<i>Korney Tertychny, Dmitry Krivolapov, Sergey Karpov and Alexander Khoperskov</i>	
Web-based Solutions in Modeling and Analysis of Geomagnetic Field and its Variations	282
<i>Nafisa Yusupova, Peter Groumpas, Andrei Vorobev and Gulnara Vorobeva</i>	
Model of Organization of Network Project-Research Students Activities in Collaboration with City-Forming Enterprises	290
<i>Svetlana Zenkina, Olga Pankratova, Ekaterina Konopko and Aleksandr Ardeev</i>	

Control of the latent image formed as a combination of variously oriented textures	297
<i>Andrey Zharkih, Galina Shagrova, Oksana Maslova and Dmitry Sinitzin</i>	
Analysis of the information protection methods in telecommunication systems with channels split by code	303
<i>Aleksandr Zhuk, Ruslan Khachkizov, Nur-Magomed Dzhamiev, Sergey Ryabtsev, Maxim Ogur and Dmitry Scherbakov</i>	
Building the simulation model of a PLC network in the NS-3 environment	311
<i>Dmitriy Zykov, Anatoly Karassenko, Damir Urazayev and Yuri Myakochin</i>	
Development of Measures to Counter Information Extremism	318
<i>Iskandar Maratovich Azhmuhamedov and Dina Aluevna Machueva</i>	
Opportunities and Challenges in Deep Generative Models	326
<i>Evgeny I. Nikolaev</i>	
Key Information Technologies for Digital Economy	330
<i>Nafisa Yusupova and Konstantin Mironov</i>	

Author Index

A

Abdulina, Elena	123
Adamchuk, Anna	51
Alexeev, Eugeny	131
Amirokov, Stanislav	51
Angelini, Marco	1
Antonov, Vladimir	94, 245
Anzin, Ivan	237
Arapova, Olga	214
Ardeev, Aleksandr	290
Azhmuhamedov, Iskandar Maratovich	318

B

Babenko, Liudmila	11
Bakaev, Maxim	174
Balatskaya, Lidiya	75
Banshchikova, Tatiana	260
Basan, Elena	20
Bolodurina, Irina	214, 229
Bratchenko, Natalia	81

C

Catarci, Tiziana	1
Chiavarelli, Stefano	29
Chipiga, Alexander	237

D

d'Amore, Fabrizio	29
Di Iorio, Angela	41
Dichenko, Sergey	139
Drozdova, Victoriya Igorevna	162
Dzhamiev, Nur-Magomed	303

F

Fensel, Anna	199
Finko, Oleg	139
Fomina, Elena	260

G

Ganshin, Konstantin	253
Gosteva, Darya	81
Govorova, Svetlana	181
Grazhdankin, Mikhail	51
Groumpos, Peter	282
Gurchinsky, Mikhail	245

I

Isaev, Alexander	51
------------------	----

Isaev, Mikhail	51
K	
Kalmykov, Igor	147
Kalmykov, Maxim	147
Karassenko, Anatoly	311
Karavaev, Vadim	154
Karpov, Andrey Sergeevich	162
Karpov, Sergey	274
Khachkizov, Ruslan	303
Khoperskov, Alexander	274
Kiseleva, Tatyana	154
Klepikova, Alla G.	63
Klochkov, George	174
Kononova, Natalija	147
Konopko, Ekaterina	222, 290
Kormakova, Valentina N.	63
Kostyuchenko, Evgeny	75
Krivko, Irina	168
Krivolapov, Dmitry	274
Kurcheeva, Galina	174
L	
Lapina, Maria	147, 181
Lebedeva, Svetlana	168
Leotta, Francesco	266
Linets, Gennady	181
M	
Machueva, Dina Aluevna	318
Makarevich, Oleg	20
Malikov, Andrey	191
Mandritsa, Igor	199
Mandritsa, Olga	199
Manzhosova, Yulia	168
Maslova, Oksana	297
Mecella, Massimo	105, 199, 266
Medenec, Viktor	181
Melnikov, Sergey	181
Mezentsev, Dmitriy	253
Mezentseva, Oksana	222, 253
Miheev, Serge	206
Mikheev, Vikenty	206
Mironov, Konstantin	330
Miroshnikov, Sergey	214
Mochalov, Valeriy	81
Musaelian, Elena N.	63
Myakochin, Yuri	311

N	
Nemkov, Roman	222
Nikolaev, Evgeny I.	326
Novokhrestova, Dariya	75
O	
Ogur, Maxim	303
Orlinskaya, Oksana	154
P	
Pankratova, Olga	222, 290
Parfenov, Denis	214, 229
Pashintsev, Vladimir	237
Pavlov, Andrew	94
Peleshenko, Victor	199
Petrenko, Vyacheslav	94, 199, 245
Pevchenko, Svetlana	191
Pisarev, Ilya	11
Prokopenko, Yulia A.	63
R	
Ryabtsev, Sergey	94, 303
Rychkov, Sergey	131
S	
Samoilov, Filipp	105
Santucci, Giuseppe	1
Schaerf, Marco	41, 105
Scherbakov, Dmitry	303
Serbin, Vladimir	114
Shagrova, Galina	162, 297
Shatrov, Anatoliy	131
Shchegolev, Aleksey	191
Shevchenko, Aleksey	162, 253
Sinitsin, Dmitry	297
Solomonov, Dmitry	260
Solomonov, Vladimir	260
Solovyova, Irina	199
Sora, Daniele	266
Starodubtseva, Ekaterina	168
T	
Tebueva, Fariza	94, 199, 245
Tertychny, Korney	274
Teterevyatnikov, Stanislav	20
U	
Untewsky, Nikolai	245
Urazayev, Damir	311
V	
Vinokursky, Dmitry	105

Vorobev, Andrei	282
Vorobeva, Gulnara	282
Voronkin, Vladimir	191
Y	
Yakovlev, Sergey	81
Yusupova, Nafisa	282, 330
Z	
Zaporozhko, Veronika	229
Zenkina, Svetlana	290
Zharkih, Andrey	297
Zhuk, Aleksandr	303
Zykov, Dmitriy	311



SAPIENZA
UNIVERSITÀ DI ROMA

NORTH-CAUCASUS FEDERAL UNIVERSITY
INSTITUTE OF INFORMATION TECHNOLOGY
AND TELECOMMUNICATIONS



Institute of Information Technology
and Telecommunications

Stavropol, Russia, 355009
Prospect Kulakova, 2

