

**2019 IEEE International Conference on  
Information Technologies (InfoTech-2019)  
33<sup>rd</sup> issue**

**(combined forum with preliminary virtual discussion)**

**IEEE Rec. # 47 388**

19-20 September 2019  
St. St. Constantine and Elena resort  
Bulgaria

***PRELIMINARY  
PROGRAM***

*The forum is organized in the frame of  
“Days of the Science of Technical University-Sofia, 2019”*

**InfoTech-2019 Organizers****Technical University of Sofia**

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**Conference InfoTech-2019 is an event of:**

- ◆ **Faculty of Applied Mathematics and Informatics of TU-Sofia  
(Department of Informatics)**
- ◆ **College of Energy and Electronics at TU-Sofia  
(Department of Electronics & Electro-Energy)**

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Web site: <http://infotech-bg.com>

## Conference Program Overview

### Thursday, 19<sup>th</sup> September 2019

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11:00 – 12:30 On-Site Registration and Conference Materials (*Conf. Office*)

14:00 – 14:10 **Official Conference Opening**

**Section [A]: “Networking, Information Security and Privacy”**

14:10 – 15:30 **Plenary Session 1**  
Plenary Reports [A01] & [A02]

15:30 – 16:00 **Coffee Break & Discussion** in the IHS Foyer

16:00 – 18:00 **Report Session 1**  
Regular section reports [A3] ÷ [A10]

19:30 – 22:30 **Official Conference Dinner**

### Friday, 20<sup>st</sup> September 2019

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**Section [B]: “Software Technologies”**

09:00 – 10:00 **Plenary Session 2**  
Plenary Reports [B01] & [B02]

10:00 – 10:30 **Coffee Break & Poster Discussion** in the IHS Foyer  
Posters' Presentation of [B03] ÷ [B05]

**Section [C]: “Advanced Information Technologies”**

10:30 – 11:50 **Plenary Session 3**  
Plenary Reports [C01] & [C02]

11:50 – 12:40 **Report Session 3**  
Regular Section Reports [C03] ÷ [C07]

12:40 – 14:00 **Lunch Break**

**Section [D]: “Automation and Intelligent Technologies”**

14:00 – 14:30 **Plenary Session 4**  
Plenary Report [D01]

14:30 – 15:10 **Coffee Break & Poster Discussion** in the IHS Foyer  
Posters' Presentation of [D05]÷[D07] & [D11]÷[D16]

15:10 – 16:30 **Report Session 4**  
Regular Section Reports [D02]÷[D04]&[D08]÷[D10]&[D17]÷[D18]

16:30 – 16:35 **Conference Closing**

# InfoTech-2019, 19-20 September 2019

## Preliminary Scientific Program

**Thursday, 19<sup>th</sup> September 2019**

<b>14:00 – 14:10 (Conference Hall)</b>	<b>Official Opening</b>
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**Conference Opening & Welcome Speech**

<b>14:10 – 15:30 (Conference Hall)</b>	<b>Plenary Session 1</b>
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*Chairperson: Prof. Radi Romansky, D.Sc. (Bulgaria)*

### Plenary Reports in [A] “Networking, Information Security and Privacy”

14:10 **[A1] Practical Methods for Self-Testing of IoT Embedded Systems in Advanced Manufacturing**

*Prof. Iliya Georgiev, Ph.D., Ivo Georgiev*  
Metro State University of Denver (USA)

14:50 **[A2] Group Theoretic Approach to the Optimization of Spectral Representations for Circuit Synthesis**

*Prof. Radomir Stankovic, Ph.D.*  
Mathematical Institute of SASA, Beograd (Serbia)

<b>15:30 – 16:00 (Foyer)</b>	<b>Coffee Break &amp; Discussion</b>
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<b>16:00 – 17:30 (Conference Hall)</b>	<b>Report Session 1</b>
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*Chairpersons: Prof. Iliya Georgiev, Ph.D. (USA)*  
*Prof. Radomir Stankovic, Ph.D. (Serbia)*

### Regular Reports in [A] “Networking, Information Security and Privacy”

16:00 **[A3] Towards Service Based Radio Access Network**

*Evelina Pencheva, Denitsa Velkova, Ivaylo Atanasov, Ventsislav Trifonov*  
Technical University-Sofia (Bulgaria)

16:10 **[A4] Simulation-Based Self-Testing in IoT-Enabled Manufacturing**

*Iliya Georgiev, Ivo Georgiev*  
Metro State University of Denver (USA)

16:20 **[A5] Improving the Efficiency of IDPS by Using Hybrid Methods from Artificial Intelligence**

*Georgi Tsochev<sup>1</sup>, Roumen Trifonov<sup>1</sup>, Radoslav Yoshinov<sup>2</sup>, Slavcho Manolov<sup>1</sup>, Galya Pavlova<sup>1</sup>*

<sup>1</sup> Faculty of Computer Systems and Technologies, Technical University of Sofia

<sup>2</sup> Laboratory of Telematics, Bulgarian Academy of Sciences (Bulgaria)

- 16:30 **[A6] Systematic Literature Review of Blockchain Applications**  
*Elva Leka<sup>1</sup>, Besnik Selimi<sup>1</sup>, Luis Lamani<sup>2</sup>*  
<sup>1</sup>South East European University, <sup>2</sup>Polytechnic University of Tirana  
 (<sup>1</sup>North Macedonia, <sup>2</sup>Albania)
- 16:40 **[A7] New Hybrid AES Static S-Box Algorithm Using Chaotic Maps**  
*Amira S. El Batouty, Hania H. Farag, Mohamed-Amr A. Mokhtar,  
 El-Sayed A-M. El-Badawy*  
 Faculty of Electronic Engineering, University of Alexandria (Egypt)
- 16:50 **[A8] Hierarchical Machine Learning for IoT Anomaly Detection in SDN**  
*Perekebode Amangele<sup>1</sup>, Martin Reed<sup>1</sup>, Mays Al-Naday<sup>1</sup>, Nikos Thomas<sup>1</sup>,  
 Mateusz Nowak<sup>2</sup>*  
<sup>1</sup> University of Essex; <sup>2</sup> IITIS PAN, Poland (UK, Poland)
- 17:00 **[A09] Cyber Space Features – Security and Data Protection Requirements**  
*Radi Romansky, Irina Noninska*  
 Technical University of Sofia (Bulgaria)
- 17:10 **[A10] ISO 27552 as a Model for Establishment Personal Information Management Systems**  
*Tzanko Tzolov*  
 Member of the Commission for Personal Data Protection, Sofia (Bulgaria)

<b>19:30 – 22:30 (Perla Restaurant of IHS)</b>	<b>Official Conference Dinner</b>
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**Friday, 20<sup>th</sup> September 2019**

<b>09:00 – 10:00 (Conference Hall)</b>	<b>Plenary Session 2</b>
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*Chairperson: Assoc. Prof. Dimitar Tzanev, Ph.D. (Bulgaria)*

**Plenary Reports in [B] “Software Technologies”**

- 09:00 **[B1] Software Reliability – Does it Exist?**  
*Prof. Dmitry Maevsky, D.Sc.*  
 Odessa National Polytechnic University (Ukraine)
- 09:30 **[B2] Management of Time in Databases**  
*Michal Kvet, Ph.D. and Prof. Karol Matiasko, Ph.D.*  
 University of Zilina (Slovakia)

<b>10:00 – 10:30 (Foyer)</b>	<b>Coffee Break &amp; Poster Discussion</b>
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**Poster Presentations in [B] “Software Technologies”**

**[B3] Study and Analysis of the .Net Platform-based Technologies for Working with the Databases**

*Irakli Basheleishvili<sup>1</sup>, Avtandil Bardavelidze<sup>1</sup>, Khatuna Bardavelidze<sup>2</sup>*

<sup>1</sup> Akaki Tsereteli State University, <sup>2</sup> Georgian Technical University (Georgia)

**[B4] Adaptive Ant Colony Optimization Algorithm for Hierarchical Scheduling Problem**

*Olga Evg. Semenkina, Eugene Al. Popov, Olga Ern. Semenkina*  
Reshetnev Siberian State University of Science and Technology (Russia)

**[B5] Managing Uncertainty in Ontology Mapping in e-Learning Context**

*Tatyana Ivanova*  
College of Energy and Electronics at the Technical University of Sofia (Bulgaria)

**10:30 – 11:50 (Conference Hall)****Plenary Session 3**

*Chairpersons: Prof. Dmitry Maevsky D.Sc. (Ukraine)*

**Plenary Reports in [C] “Advanced Information Technologies”****10:30 [C1] Capture, Representation, and Rendering of 3D Audio for Virtual and Augmented Reality**

*Prof. Ivan Tashev, Ph.D.*  
Microsoft Research Labs, Redmond, WA (USA)

**11:10 [C2] Computational Intelligence Algorithms based Comprehensive Human Expert and Data (HEAD)-driven Models Mining for Complicated Systems Control, Optimization and Design**

*Prof. Eugene Semenkin, D.Sc.*  
Reshetnev Siberian State University of Science and Technology (Russia)

**11:50 – 12:40 (Conference Hall)****Report Session 3**

*Chairpersons: Prof. Ivan Tashev, Ph.D. (USA)*  
*Prof. Eugene Semenkin, D.Sc. (Russian Federation)*

**Regular Reports in [C] “Advanced Information Technologies”****11:50 [C3] Sentiment Detection from ASR Output**

*Ivan J. Tashev, Dimitra Emmanouilidou*  
Microsoft Research Labs, Redmond, WA (USA)

**12:00 [C4] Discovering Business Process Map of Most Frequent Running Cases in Event log**

*Mohsen Mohammadi*  
Esfarayen University of Technology (Iran)

**12:10 [C5] Attract the Students’ Interest with the Use of Videos for the Teaching of the “Acid-Bases-Salts” Module**

*A. Thysiadou<sup>1</sup>, A. Solomanidou<sup>2</sup>, S. Christoforidis<sup>3</sup>*  
<sup>1</sup> Eastern Macedonia and Thrace Institute of Technology, <sup>2</sup> Aristotle University of Thessaloniki; <sup>3</sup> Library of Technological Education Institute of Eastern Macedonia and Thrace, Kavala (Greece)

**12:20 [C6] Hand Gesture Detection**

*Pinar Kirci, M. Fatih Cambek*  
Istanbul University – Cerrahpasa, Istanbul (Turkey)

**12:30 [C7] Energy Provider Data Warehouse Design and Implementation – Case Study**

*Nertila Kryeziu, Florije Ismaili, Jaumin Ajdari, Bujar Raufi, Xhemal Zenuni*  
South East European University, Tetovo (North Macedonia)

**12:40 – 14:00 Lunch Break**



14:00 – 14:30 (Conference Hall)

Plenary Session 4

Chairperson: Assoc. Prof. Nikolay Hinov, Ph.D. (Bulgaria)

**Plenary Report in [D] “Automation and Intelligent Technologies”**

14:00 **[D1] Can the Synthesis of DC Motor Cascade Control Parameters be the Same as for the Field-Oriented Controlled Induction Motor**

*Prof. Goran Rafailovski*

Ss. Cyril and Methodius University in Skopje (North Macedonia) &  
SRH Hochschule Berlin (Germany)

14:30 – 15:10 (Foyer)

Coffee Break &amp; Poster Discussion

**Poster Presentations in [D] “Automation and Intelligent Technologies”**

**Automation of Research**

**[D5] Automatic Design of Fuzzy Controller for Rotary Inverted Pendulum with Success-History Adaptive Genetic Algorithm**

*Vladimir Stanovov, Shakhnaz Akhmedova, Eugene Semenkin*

Reshetnev Siberian State University of Science and Technology (Russian Federation)

**[D6] Mathematical Modelling of Electronic Circuits with Index Matrices**

*Nikolay Lyuboslavov Hinov; Polyva Vassileva Gocheva; Valeri Petrov Gochev*

Technical University of Sofia (Bulgaria)

**[D7] Formalization of Basic Electronic Components with Index Matrices and Their Software Implementation**

*Valeri Petrov Gochev; Nikolay Lyuboslavov Hinov; Polyva Vassileva Gocheva*

Technical University of Sofia (Bulgaria)

**Intelligent Technologies**

**[D11] New Methods of Training Two-Layer Sigmoidal Neural Networks with Regularization**

*Vladimir Nikolaevich Krutikov, Guzel Sharipzhanovna Shkaberina,*

*Mikhail Nikolaevich Zhalnin, Lev Alexandrovich Kazakoutsev*

Reshetnev University, Krasnoyarsk (Russian Federation)

**[D12] Reinforcement Learning in Collective Robots**

*Vanya Markova, Ventseslav Shopov*

Institute of Robotics, Bulgarian Academy of Science (Bulgaria)

**[D13] Knowledge Transfer in Reinforcement Learning Agent**

*Vanya Markova, Ventseslav Shopov*

Institute of Robotics, Bulgarian Academy of Science (Bulgaria)

**[D14] Identification of Non-linear Dynamic System**

*Ventseslav Shopov, Vanya Markova*

Institute of Robotics, Bulgarian Academy of Science (Bulgaria)

**[D15] A Survey of Reinforcement Learning for Formation Control**

*Ventseslav Shopov, Vanya Markova*

Institute of Robotics, Bulgarian Academy of Science (Bulgaria)

**[D16] Prediction of Travel Time Using Historical Data**

*Raymond Sondak, Leon Rothkrantz*

Czech Technical University in Prague, Delft University of Technology  
(Czech Republic, The Netherlands)



15:10 – 16:30 (Conference Hall)

Report Session 4

Chairpersons: Prof. Goran Rafajlovski, Ph.D. (North Macedonia & Germany)  
Dr. Michal Kvet (Slovakia)

### Regular Reports in [D] “Automation and Intelligent Technologies”

#### Automation of Research

15:10 [D2] **Managing Risks in the Merger & Acquisition Process by IT Companies**

*Goce Micevski<sup>1</sup>, Vangel Fustik<sup>2</sup>, Natalija Petrova<sup>2</sup>*

<sup>1</sup> Seavus AB Sweden, <sup>2</sup> University Sts. Cyril and Methodius, Skopje, Skopje (North Macedonia)

15:20 [D3] **Transient in the Software Systems. Untraditional Approach to Software Reliability**

*Dmitry Maevsky, Elena Maevskaya, Andriy Bojko, Oleksandr Besarab*

Odessa National Polytechnic University (Ukraine)

15:30 [D4] **Markov Chain Model for Small Hydro Power Plant Reliability and Operation Evaluation**

*Natasha Dimishkovska, Atanas Iliev*

University Ss. Cyril and Methodius, Skopje (North Macedonia)

#### Intelligent Technologies

15:40 [D8] **Online Selective Evolutionary Hyperheuristic for Large Scale Economic Load Dispatch Problem**

*Evgenii Sopov and Sergey Videnin*

Siberian Federal University, Krasnoyarsk (Russian Federation)

15:50 [D9] **Intelligent System for Air Quality Monitoring Assessment using the Raspberry Pi Platform**

*Desislava Ivanova, Angel Elenkov*

Department of Informatics, Technical University of Sofia (Bulgaria)

16:00 [D10] **How to Transform Real Time Traffic Information into a Historical Database Used for Dynamic Routing**

*Leon Rothkrantz*

Department of Intelligent Systems, Delft University of Technology (The Netherlands)

#### Technologies in e-Governance

16:10 [D17] **A Survey of Level of Information Technology Literacy of e-Government Users in BiH**

*Srdan Nogo, Dragan Manjak*

Faculty of Electrical Engineering, University of East Sarajevo (Bosnia and Herzegovina)

16:20 [D18] **Extending an Open Source Learning Management System (Open eClass) as a Student Project**

*Dimitrios Liarokapis, Dimitrios Exarhos, Constantinos Tsibanis, Lazaros Merakos*

University of Ioannina, P&I Hellas (Greece)

16:30 Conference Closing

## InfoTech papers Indexing and Abstracting

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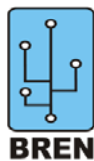


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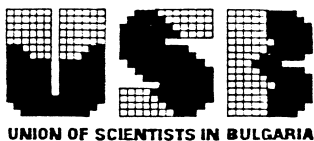
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