UNIVERSITY of RUSE
8 STUDENTSKA STREET

The new building

The main building
Dear Participants,

University of Ruse is a member of Eduroam world project and if your University/Organization is a member too, you can use your credentials to access internet via our wireless network.

You can also use free WIRELESS INTERNET via access points named CompSys with password compsys19.

You can also use the COMPUTERS in the Centre for PhD students - main building, in the middle of the 3 floor 1.411-4.
CONFERENCE OBJECTIVE

The CompSysTech’19 International Conference is organized by the Bulgarian Academic Society of Computing and its OBJECTIVE is to intensify the information exchange of results in theoretical research and practical developments in the field. Since 2007 to 2018 all papers presented at the conference and published in the conference proceedings have been published in the ACM Digital Library, registered in the US Congress Library and indexed in SCOPUS, dblp, etc.

CompSysTech’19 is organized under the patronage of the:
• Bulgarian Ministry of Education and Science;
• John Atanasoff Union of Automation and Informatics;
• University of Ruse

INTERNATIONAL PROGRAMME COMMITTEE

• Honorary Co-Chairs:
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  Vasil Sgurev (Member of BAS, Bulgaria)

• Co-Chair:
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  Tzvetomir Vassilev (Bulgaria)

• Scientific Secretary:
  Dimo Dimov (Bulgaria)

• Secretary:
  Pavel Zlatarov (Bulgaria)

• Members:

<table>
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<td>Adem Karahoca</td>
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Dana Petcu
Romania
Milan Dimitrijevic
Serbia

Danail Dochev
Bulgaria
Mirjana Ivanovic
Serbia

Daniela Chuda
Slovakia
Murat Köklü
Turkey

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New Zealand

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Turkey

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Bulgaria
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Tsvetozar Georgiev
Bulgaria

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Latvia
Zhyldyzbek Zhakshylykov
Kyrgyzstan

Janusz Jablonskowski
Poland
Zoltan Geler
Serbia

♦ NATIONAL ORGANIZING COMMITTEE

• Co-Chairs:
  Angel Smrikarov (Bulgaria)
  Galina Ivanova (Bulgaria)

• Secretary:
  Eugenia Dimitrova (Bulgaria)

• Members:
  Tsvetozar Georgiev (Bulgaria)
  Stoyanka Smrikarova (Bulgaria)
  Aneliya Ivanova (Bulgaria)
  Yuksel Aliev (Bulgaria)

♦ TOPICS

1. Computer Hardware.
2. Computer Software.
5. The Youth and the Computer Systems and Technologies
Friday, 21st June 2019
08:00 – 18:00
New building, Hall 2Г.207
REGISTRATION

13:30
New building, Hall 2Г.204 SIEMENS
Demonstration of humanoid robots

14:00
New building, Hall 2Г.204 SIEMENS
OPENING
WELCOME
Chair: Angel Smrikarov

20 YEARS
BULGARIAN ACADEMIC SOCIETY
OF COMPUTER SYSTEMS
AND INFORMATION TECHNOLOGIES
Chair: Roumen Trifonov
PLENARY SESSION
Chair: Tzvetomir Vassilev

IVAN DIMOV
Institute of Information and Communication Technologies,
Bulgarian Academy of Sciences,
Sofia, Bulgaria

Keynote on:
How close we are to the real Quantum Computer?
Efficient Monte Carlo algorithms for Wigner Monte Carlo Method

AVRAM ESKENAZI
Institute of Mathematics and Informatics,
Bulgarian Academy of Sciences,
Sofia, Bulgaria

Keynote on:
IT impact on the labor market –
professions to disappear and new ones to emerge

ROMAN ZAHARIEV
Nina Valchkova, George Angelov,
Yasen Paunski, Aleksander Krastev
Institute of Robotics,
Bulgarian Academy of Sciences,
Sofia, Bulgaria

Keynote on:
Robots for Help of Pedagogy and Rehabilitation with disabilities

DISCUSSIONS

Walking tour of the University of Ruse
Visiting the multimedia museum of the University
Friday, 21\textsuperscript{th} June 2019
19:30
SOCIAL EVENING IN THE RESTAURANT “RIGA”
22 PRIDUNAVSKI BLVD
2 floor
# PROGRAMME SUMMARY

Saturday, 22\textsuperscript{th} June 2019

<table>
<thead>
<tr>
<th>Time</th>
<th>Hall 2.204</th>
<th>Hall 2.205</th>
<th>Hall 2.206</th>
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<tbody>
<tr>
<td>9:00 – 11:30</td>
<td>Session A</td>
<td>Session C</td>
<td>Session E</td>
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<td>12:00 – 14:30</td>
<td>Session B</td>
<td>Session D</td>
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<td>THE BEST PAPERS AWARDS</td>
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CompSysTech’19
Session A

Chair: Zaza Davitadze  
Co-Chair: Grisha Spasov  
Scientific Secretary: Pavel Zlatarov

Saturday, 22nd June 2019  
9:00 – 11:30  
New building, Hall 2.204

COMPUTER HARDWARE

1. Internet of Things - Models and Basic Architectures  
   Grisha Spasov

2. Hardware Divider. Calculation of the Remainder  
   Dimitar Tyanev and Yulka Petkova

3. Three-Sensor Portable Information System for Physiological Data Registration  
   Mitko Gospodinov and Krassimir Cheshmedziev

NETWORK AND INFORMATION SECURITY

1. An Inquiry into Localized Email Spam  
   Sampsa Rauti

2. Malicious Software Detection utilizing Temporal-Graphs  
   Anna Mpanti, Stavros Nikolopoulos and Iosif Polenakis

3. Conceptualizing a collaboration framework between Blockchain technology and the Internet of Things  
   Sasa Pesic, Mirjana Ivanovic, Milos Radovanovic, Milenko Tosic, Ognjen Ikovic and Dragan Boskovic

4. Evaluation of the Complexity of Fully Homomorphic Encryption Schemes in Implementations of Programs  
   Dimitar Chakarov and Yavor Papazov

5. Main Considerations in Elaborating Organizational Information Security Policies  
   Todor Tagarev and Dimitrina Polimirova

DISCUSSIONS

11:30 – 12:00  
2.203  
Coffee Break
Session B

Chair: Bojan Cestnik
Co-Chair: Dimo Dimov
Scientific Secretary: Pavel Zlatarov

Saturday, 22\textsuperscript{nd} June 2019
12:00 – 14:30
New building, Hall 2.204

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

1. Artificial intellect – Regulatory Framework and Challenges Facing the Labour Market
   Andriyana Andreeva, Galina Yolova and Diana Dimitrova

2. Obstacle avoidance algorithms for mobile robots
   Dilyana Budakova, Galya Pavlova, Roumen Trifonov and Ivan Chavdarov

3. Enrichment of EHR with Linked Open Data for Risk Factors Identification
   Svetla Boytcheva, Galia Angelova, Zhivko Angelov, Dimitar Tcharaktchiev and Vlaiko Vodenicharov

4. Declarative Implementations of Genetic Algorithms in Control Network Programming
   Emilia Golemanova and Tsanko Golemanov

5. A genetic approach to the maximum common subgraph problem
   Cesare Fabio Valenti

6. Rough Graded Possibilistic Meta--Outlier Detection in Granular Clustering
   Alessio Ferone and Antonio Maratea

7. Filters in Convolutional Neural Networks as Independent Detectors of Visual Concepts
   Anton Hristov, Maria Nisheva and Dimo Dimov

8. Supporting decisions with fast and frugal trees for improving trust in public housing services
   Bojan Cestnik and Alenka Kern

DISCUSSIONS

14:30
Hall 2Г.204 SIEMENS
THE BEST PAPERS AWARDS
Session C

Chair: David Devadze
Co-Chair: Virginiya Dimitrova
Scientific Secretary: Vladimir Dochev

Saturday, 22nd June 2019
9:00 – 11:30
New building, Hall 2.205

COMPUTER SOFTWARE

1. Computationally Intensive Tasks in Designing and Operating Distributed Cyber Secure and Resilient Systems
   Todor Tagarev, George Sharkov

2. A Survey on State of Software Quality Assurance
   Peter Sabev and Katalina Grigorova

3. Solution of the Optimal Control Problem for Helmholtz Equations with m-Point Nonlocal Boundary Conditions Using MEDG Method
   Vakhtang Beridze and David Devadze

4. OAtools – Software package for investigation of orthogonal arrays
   Venelin Monev and Maya Hristova

5. Determination of the Computer Modelling Precision for Throughput of Switch Node with LPF-algorithm
   Tasho Tashev, Radostina Tasheva and Petar Petrov

6. Improvement of the Geometric Environment Used for Simulation and Visualization of Field Distribution
   Virginiya Dimitrova

7. Analysis of the Quality of Points of Interests in the Most Popular Location-based Games
   Samuli Laato, Tarja Pietarinen, Sampsa Rauti and Teemu Laine

DISCUSSIONS

11:30 – 12:00
2.203
Coffee Break
Session D

Chair: Domenico Tegolo
Co-Chair: Tsvetozar Georgiev
Scientific Secretary: Vladimir Dochev

Saturday, 22nd June 2019
12:00 – 14:30
New building, Hall 2.205

IMAGE, TIME SERIES AND SIGNAL PROCESSING

1. Cheese quality evaluation by image segmentation
   Angel Danev, Atanaska Bosakova-Ardenska, Petya Boyanova, Peter Panayotov and Lena Kostadinova-Georgieva

2. Blue cheese cut surface evaluation by images analysis
   Vladimira Ganchovska, Atanaska Bosakova-Ardenska, Peter Panayotov, Lena Kostadinova-Georgieva, Angel Danev and Ivanka Krasteva

3. Method for Contour Detection of Water Areas
   Gergana Spasova

4. A Wavelet approach to extract main features from indirect immunofluorescence images
   Domenico Tegolo, Giuseppe Raso, Riccardo Di Palermo and Donato Cascio

5. Time Series Analysis Using Fractal and Multifractal Methods
   Evgeniya Gospodinova

6. Computation of Time Series Scaling Exponent for Electricity Prices Forecasting
   Ekaterina Popovska and Mitko Gospodinov

7. Wavelet Based Interval Varying Algorithm for Optimal Non-Stationary Signal Denoising
   Galya Georgieva-Tsaneva

DISCUSSIONS

14:30
Hall 2G.204 SIEMENS
THE BEST PAPERS AWARDS
APPLICATION ASPECTS OF COMPUTER SYSTEMS AND TECHNOLOGIES

1. **How to integrate complex optimal data processing in information services in internet**
   *Todor Stoilov*

2. **A REST-based Framework to Support Non-Invasive and Early Coeliac Disease Diagnosis**
   *Salvatore Sorce, Vito Gentile, Donato Cascio, Angele Giuliano, Marco Tabacchi, Vincenzo Taormina, Domenico Tegolo, Cesare Valenti and Giuseppe Raso*

3. **Provision of Tailored Health Information for Patient Empowerment: An Initial Study**
   *Marco Alfano, Biagio Lenzitti, Davide Taibi and Markus Helfert*

4. **An algorithm for calculation of own ship’s course over ground and speed over ground using ARPA, by acquiring a fixed object**
   *Blagovest Belev and Dilyan Dimitranov*

5. **Enhancing Accuracy and Precision of eye tracker by head movement compensation and calibration**
   *Kiril Alexiev, Teodor Toshkov and Peter Dojnov*

6. **Using Lindenmayer Systems For Generative Modeling Of Graphic Concepts, Set In Elements Of Bulgarian Folklore Embroidery**
   *Desislava Baeva*

7. **Practical application of heuristic approaches to improving the network architecture of a courier company**
   *Georgi Shipkovenski and Oleg Asenov*

**DISCUSSIONS**

11:30 – 12:00
2.203
Coffee Break
Session F

Chair: Svetlana Stefanova
Co-Chair: Yavor Dankov
Scientific Secretary: Vasil Kouzov

Saturday, 22nd June 2019
12:00 – 14:30
New building, Hall 2.206

DATA MANAGEMENT AND INFORMATION RETRIEVAL

1. Models for web applications data analysis
   Snezhana Sulova

   Yavor Dankov

3. Assessment of Black Litterman portfolio optimization on Bulgarian Stock Exchange
   Krasimira Stoilova, Todor Stoilov and Miroslav Vladimirov

   Dessislava Petrova-Antonova, Iva Krasteva, Sylvia Ilieva and Irena Pavlova

5. Comparison between advanced software technologies for creating web systems working with Big Data
   Svetlana Stefanova and Iliya Draganov

6. A Novel Document Summarization System for Albanian Language
   Evis Trandafili, Hakik Paci and Elona Karaj

7. A Basic Testbed for JSON Data Processing in SQL Data Servers
   Ionuț Hrubaru Hrubaru, George Talabă and Marin Fotache

DISCUSSIONS

14:30
Hall 2Γ.204 SIEMENS
THE BEST PAPERS AWARDS
Session G

Chair: Roumiana Peytcheva-Forsyth
Co-Chair: Milen Loukantchevsky
Scientific Secretary: Yuksel Aliev

Saturday, 22th June 2019
09:00 – 11:30
New building, Hall 2.207

EDUCATIONAL ASPECTS
OF COMPUTER SYSTEMS AND TECHNOLOGIES
(ICK-based Educational Technologies)

1. A pedagogical perspective towards ICT-based innovative educational technologies - case study on Tessa Integration in e-assessment
   Roumiana Peytcheva-Forsyth

2. A bilingual ontology mapping and enrichment approach for domain ontologies in e-learning
   Tatyana Ivanova

3. Space Safari – Challenge for STEM Rangers
   Elitsa Peltekova, Eliza Stefanova and Nikolina Nikolova

4. Implementation of a Training Parser Using Explicit Abstract Syntax Tree
   Ivaylo Penev and Milena Karova

5. A Testbed of Non-determinism in Educational Context
   Milen Loukantchevsky, Nikolay Kostadinov and Hovanes Avakyan

6. Integration Of „Business Intelligence“ Course To Master Academic Studies In Informatics
   Aleksandra Klašnja-Milićević, Nevena Ranković and Mirjana Ivanović

7. Resources and Semantic-based knowledge models for personalized and self regulated learning in the Web: survey and trends
   Tatyana Ivanova

DISCUSSIONS

11:30 – 12:00
2.203
Coffee Break
Session H

Chair: Galina Ivanova
Co-Chair: Valentina Petrova
Scientific Secretary: Yuksel Aliev

Saturday, 22\textsuperscript{th} June 2019
12:00 – 13:00
New building, Hall 2.207

EDUCATIONAL ASPECTS
OF COMPUTER SYSTEMS AND TECHNOLOGIES
(ITU-based Educational Technologies)

1. Innovative eLearning Technologies in the Open Education Era
   Pavel Boytchev and Svetla Boytcheva

2. Using the Analytic Hierarchy Process for LMS selection
   Valentina Petrova

3. Technological Model for Implementation of m-Learning in Higher Education
   in Republic of Yemen
   Georgi Tupalov, Abdulrahman Al-Sabri and Daniela Tupalova

DISCUSSIONS
Session I

Chair: Peter Kenderov  
Co-Chair: Aneliya Ivanova  
Scientific Secretary: Yuksel Aliev

Saturday, 22th June 2019  
13:00 – 14:30  
New building, Hall 2.207

THE YOUTH AND THE ICT

1. 3D Educational game for learning notes „3D MuSic“  
   Mariya Kirilova, Syuzan Feimova

2. Geometric shapes  
   Rostislav Gordeev, Syuzan Feimova

3. Collection of classical games  
   Ivan Petrov, Erik Nikolov, Syuzan Feimova

4. History of logical games  
   Velislava Krumova, Dilyana Doycheva, Syuzan Feimova

5. Swarm intelligence  
   Monika Velikova, Selin Shemsieva, Syuzan Feimova

DISCUSSIONS

14:30  
Hall 2Г.204 SIEMENS  
THE BEST PAPERS AWARDS
Saturday, 22\textsuperscript{th} June 2019
14:30
New building, Hall 2\textGamma.204 SIEMENS

The CHAIRS
of the PROGRAMME COMMITTEE
and
the ORGANIZING COMMITTEE
will bestow
a CRYSTAL PRIZE
to the authors of the best papers.

Saturday, 22\textsuperscript{th} June 2019
15:00
New building, Hall 2\textGamma.204 SIEMENS

Meeting
of the PROGRAMME COMMITTEE and ORGANIZING COMMITTEE
and the chairs of each sections
of the CompSysTech’19
Paintings from RUSE