# UNIVERSITY of RUSE
# 8  STUDENTSKA  STREET



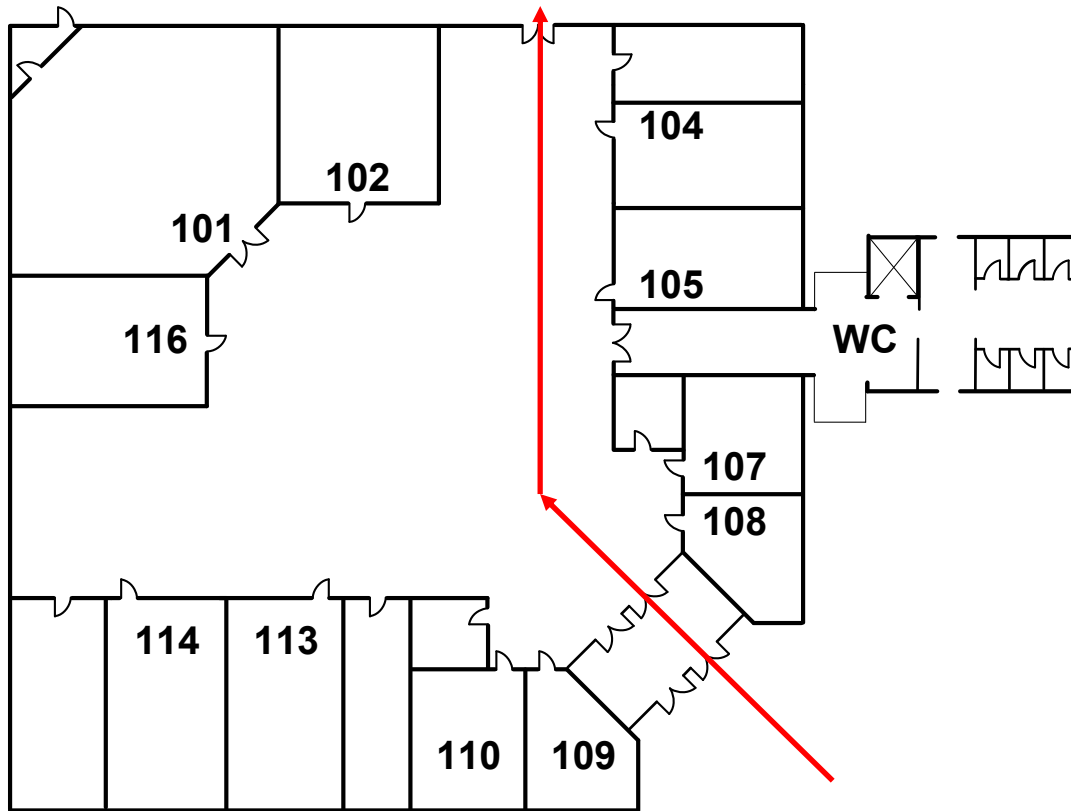**The new building**          **The main building**

## THE NEW BUILDING

### Hall 2Г.204 SIEMENS



| 102 | 101 | 104 |
| 116 | | 105 |
| | | WC |
| 114 | 113 | 107 |
| 110 | 109 | 108 |



CAFE SNACK

RESTAURANTS

BANK



### 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 **compsys18**.

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'18* International Conference is organized **by the Association for Computing Machinery, N.Y., USA via its Bulgarian Chapter – acmbul** and **by the Bulgarian Academic Society of Computer Systems and Information Technologies** and its OBJECTIVE is to intensify the information exchange of results in theoretical research and practical developments in the field.

*CompSysTech'18* is organized under the patronage of:
- **Bulgarian Ministry of Education and Science;**
- **John Atanasoff Union of Automation and Informatics**

## ♦ INTERNATIONAL PROGRAMME COMMITTEE

- **Honorary Co-Chairs:**

Kiril Boyanov (Member of BAS, Bulgaria)
Vasil Sgurev (Member of BAS, Bulgaria)

- **Chair:**

Boris Rachev (Bulgaria)

- **Scientific Secretary:**

Dimo Dimov (Bulgaria)

- **Secretary:**

Yordan Kalmukov (Bulgaria)

- **Members:**

Alexander Sudnitson (Estonia)
Alla Anohina-Naumeca (Latvia)
Antanas Zilinskas (Lithuania)
Antonio Corral (Spain)
Antonio Mendes (Portugal)
Avram Eskenazi (Bulgaria)
Benczúr András (Hungary)
Bojan Cestnik (Slovenia)
Boris Novikov (Russia)
Christine Choppy (France)
Constantinos Pattichis (Cyprus)
Dana Petcu (Romania)
Danail Dochev (Bulgaria)
Daniela Chuda (Slovakia)
Darina Dicheva (United States)
Dieter Wuttke (Germany)
Dimitris Karagiannis (Austria)
Dmitry Korzun (Russia)
Douglas Harms (United States)
Erika Nazaruka (Latvia)
Eugenijus Macikenas (Lithuania)
George Mavrommatis (Greece)
Grisha Spasov (Bulgaria)
Gunter Saake (Germany)
Guntis Arnicans (Latvia)
Hannu Jaakkola (Finland)
Hilda Tellioglu (Austria)

Iliya Georgiev (United States)
Jaak Tepandi (Estonia)
Janis Grundspenkis (Latvia)
Janusz Jabłonowski (Poland)
Juliana Peneva (Bulgaria)
Karl Jones (United Kingdom)
Kostadin Kratchanov (Turkey)
Krassen Stefanov (Bulgaria)
Ladislav HUDEC (Slovakia)
Leon Rothkrantz (Netherlands)
Leoneed Kirilov (Bulgaria)
Lyudmil Dakovski (Bulgaria)
Marco Porta (Italy)
Margarita Todorova (Bulgaria)
Maria Bielikova (Slovakia)
Maria Koziri (Greece)
Maria Jose Marcelino (Portugal)
Marite Kirikova (Latvia)
Markus Helfert (Ireland)
Melih İnal (Turkey)
MICHAEL VASSILAKOPOULOS (Greece)
Mirjana Ivanovic (Serbia)
Nicolas Tsapatsoulis (Cyprus)
Nikola Kasabov (New Zealand)
Nikolay Mehandjiev (United Kingdom)
Nikos Konofaos (Greece)
Novruz Allahverdi (Turkey)

Olegas Vasilecas (Lithuania)             Tanja Urbančič (Slovenia)
Peter Stanchev (United States)          Theodoros Tzouramanis (Greece)
Rebecca Bartlett (United Kingdom)       Timos Sellis (Australia)
Robert Buchmann (Romania)               Tzvetomir Vassilev (Bulgaria)
Saulius Gudas (Lithuania)               Ville Leppänen (Finland)
Stavros Nikolopoulos (Greece)           Vladimir Lazarov (Bulgaria)
Stoicho Stoichev (Bulgaria)             Wladyslaw Homenda (Poland)
Tadeusz Morzy (Poland)                  Wojciech Froelich (Poland)

## ♦ NATIONAL ORGANIZING COMMITTEE

• **Co-Chairs:**

Angel Smrikarov (Bulgaria)
Tzvetomir Vassilev (Bulgaria)

•**Secretary:**

Eugenia Dimitrova (Bulgaria)

• **Members:**

Tsvetozar Georgiev (Bulgaria)
Stoyanka Smrikarova (Bulgaria)
Galina Ivanova (Bulgaria)
Aneliya Ivanova (Bulgaria)
Yuksel Aliev (Bulgaria)

## ♦ TOPICS

1. **Computer Hardware.**
2. **Computer Software.**
3. **Application Aspects
   of Computer Systems and Technologies.**
4. **Educational Aspects
   of Computer Systems and Technologies
   (ICT-based educational technologies).**
5. **The Youth and the Computer Systems and Technologies**
   • **PhD Students' Section;**
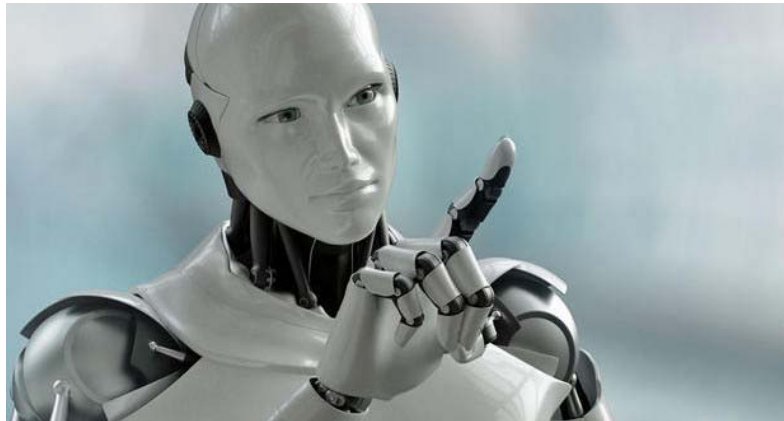   • **Students' Section;**
   • **High-School Students' Section.**

**Thursday, 13th September 2018**

**08:00 – 18:00**
**New building, Hall 2Г.207**
**REGISTRATION**

**Demonstration of humanoid robots**



**15:00**
**New building, Hall 2Г.204 SIEMENS**

# O P E N I N G

**WELCOME**

Chair: **Angel Smrikarov**

**MUSICAL GREETING**

# PLENARY  SESSION
Chair: **Boris Rachev**

**ELENA MARINOVA**
**Musala Soft, Bulgaria**

Keynote on:
**Internet of Everything - what awaits us?**

**NIKOLA KASABOV**
**Knowledge Engineering and Discovery Research Institute, Auckland, New Zealand**
**First Prize of International Neural Network Society**

Keynote on:
**Deep Learning in Spiking Neural Networks for Brain-Inspired Artificial Intelligence**

**PETER STANCHEV**
**Kettering University, USA**

Keynote on:
**Building the Innovative and Entrepreneurial University**

**DISCUSSIONS**

**17:00**

**Walking tour of the University of Ruse**

**Visiting the multimedia museum of the University of Ruse**

**Thursday, 13th September 2018**
**19:30**
**SOCIAL EVENING IN THE RESTAURANT "RIGA"**
**22 PRIDUNAVSKI BLVD**
**2 floor**

## PROGRAMME SUMMARY

## Friday, 14th September 2018

| | Hall 2.205 | Hall 2.206 | Hall 2.207 |
|---|---|---|---|
| **9:00 – 11:30** | **Session A1**<br><br>**Artificial Intelligence and Information Retrieval (1)**<br>Number of papers: 8 | **Session B**<br><br>**Information Systems**<br>Number of papers: 4<br>**Cloud Computing**<br>Number of papers: 2 | **Session D**<br><br>**Educational Aspects of Computer Systems and Technologies (ICT-based Educational Technologies)**<br>Number of papers: 6 |
| **11:30 – 12:00** | **COFFEE BREAK**<br><br> | | |
| **12:00 – 14:00** | **Session A2**<br><br>**Artificial Intelligence and Information Retrieval (2)**<br>Number of papers: 2<br>**Image Processing and Computer Vision**<br>Number of papers: 3 | **Session C**<br><br>**Computer Applications in Engineering and Medicine**<br>Number of papers: 3<br>**Digital Signal Processing**<br>Number of papers: 2<br>**Hardware**<br>Number of papers: 1 | **Session E**<br><br>**The Youth and the ICT**<br>Number of papers: 2 |
| **14:00 – 14:30** | **THE BEST PAPERS AWARDS**<br><br> | | |

## Session A1

Chair: **Stavros D. Nikolopoulos**
Co-Chair: **Tsvetozar Georgiev**
Scientific Secretary: **Vladimir Dochev**

**Friday, 14th September 2018**
**9:00 – 11:30**
**New building, Hall 2.205**

### ARTIFICIAL INTELLIGENCE AND INFORMATION RETRIEVAL (1)

1. **Improving the Performance of Unitary Recurrent Neural Networks and Their Application in Real-life Tasks**
   *Ivan Ivanov, Li Jing, Rumen Dangovski*

2. **An Overview of Local Approach for Time Series Analysis and Prediction**
   *Ventsislav Nikolov*

3. **Hybrid dynamic route planners**
   *Leon Rothkrantz*

4. **A Graph-based Model for Malicious Software Detection Exploiting Domination Relations between System-call Groups**
   *Anna Mpanti, Stavros D. Nikolopoulos, Iosif Polenakis*

5. **Neighborhood-based Strategies for Widening of the Greedy Algorithm of the Set Cover Problem**
   *Violeta Nikolaeva Ivanova-Rohling*

6. **Communication-less Strategies for the Widening of Rule Induction**
   *Violeta Nikolaeva Ivanova-Rohling*

7. **Virtual Intelligent Personal Assistant for Bat Researchers**
   *Angel Ivanov, Daniela Orozova*

8. **Using Big Data Value Chain to Create Government Education Policies**
   *Dessislava Petrova-Antonova, Sylvia Ilieva*

### DISCUSSIONS

**11:30 – 12:00**
**2.203**
**Coffee Break**

## Session A2

Chair: **Daniela Chuda**
Co-Chair: **Tsvetozar Georgiev**
Scientific Secretary: **Vladimir Dochev**

**Friday, 14<sup>th</sup> September 2018**
**12:00 – 14:00**
**New building, Hall 2.205**

### ARTIFICIAL INTELLIGENCE AND INFORMATION RETRIEVAL (2)

1. **Cross lingual and multilingual ontology mapping - survey**
   *Tatyana Ivanova*

2. **Source code authorship approaches natural language processing**
   *Juraj Petrík, Daniela Chuda*

### IMAGE PROCESSING AND COMPUTER VISION

1. **An Algorithm for Histogram Median Thresholding**
   *Atanaska Bosakova-Ardenska, Angel Danev*

2. **Bread porosity evaluation by histogram analysis**
   *Atanaska Bosakova-Ardenska, Angel Danev, Hristina Andreeva, Tzvetana Gogova*

3. **Performance Evaluation of Deep Learning Networks for Semantic Segmentation of Traffic Stereo-Pair Images**
   *Vlad Taran, Nikita Gordienko, Yuriy Kochura, Yuri Gordienko, Alexandr Rokovyi, Oleg Alienin, Sergii Stirenko*

### DISCUSSIONS

**14:00**
**Hall 2Γ.204 SIEMENS**
**THE BEST PAPERS AWARDS**

## Session B

Chair: **Ville Leppänen**
Co-Chair: **Tzvetomir Vassilev**
Scientific Secretary: **Jordan Kalmukov**

**Friday, 14th September 2018**
**9:00 – 11:30**
**New building, Hall 2.206**

### INFORMATION SYSTEMS

1. **Investigation of Higher Education ERP implementation factors**
   *Blerta Abazi Chaushi, Agron Chaushi, Zamir Dika, Florije Ismaili*

2. **Development and Practical Use of a Medical Vocabulary-Thesaurus-Dictionary for Patient Empowerment**
   *Marco Alfano, Biagio Lenzitti, Giosuè Lo Bosco, Davide Taibi*

3. **Web Technologies Used in the Commercial Banks in Finland**
   *Pavel Petrov, Stefan Krumovich, Nikola Nikolov, Georgi Dimitrov, Vladimir Sulov*

4. **A Study on Gaze-Controlled PIN Input with Biometric Data Analysis**
   *Virginio Cantoni, Tomas Lacovara, Marco Porta, Haochen Wang*

### CLOUD COMPUTING

1. **Virtual Machine Introspection based Cloud Monitoring Platform**
   *Samuel Laurén, Ville Leppänen*

2. **Big Data Technologies on Commodity Workstations. A Basic Setup for Apache Impala**
   *Marin Fotache, Valerică Greavu-Șerban, Ionuț Hrubaru, Alexandru Tică*

### DISCUSSIONS

**11:30 – 12:00**
**2.203**
**Coffee Break**

## Session C

Chair: **Virginio Cantoni**
Co-Chair: **Tzvetomir Vassilev**
Scientific Secretary: **Jordan Kalmukov**

**Friday, 14th September 2018**
**12:00 – 14:00**
**New building, Hall 2.206**

### COMPUTER APPLICATIONS IN ENGINEERING AND MEDICINE

1. **Manipulability and Kinematic Dependences of the Six-Legged Robot Legs**
   *Ivan Chavdarov, Roumen Trifonov, Galya Pavlova , Dilyana Budakova*

2. **Software tools for mechanical structures resonant frequencies determination**
   *Svetlin Stoyanov*

3. **Visualization of Simulated Arrhythmias due to Gap Junctions**
   *Antonio Ienna, Michele Migliore, Cesare Valenti*

### DIGITAL SIGNAL PROCESSING

1. **Digital Processing of Two-Dimensional Signals in the Basis of Haar Wavelets**
   *H.N. Zaynidinov, M.B. Zaynutdinova, E.Sh. Nazirova*

2. **Heart Rate Variability Generating Based on Matematical Tools**
   *Galya Georgieva-Tsaneva*

### HARDWARE

1. **Hardware Divider**
   *Dimitar Tyanev, Yulka Petkova*

### DISCUSSIONS

**14:00**
**Hall 2Г.204 SIEMENS**
**THE BEST PAPERS AWARDS**

## Session D

Chair: **Leon Rothkrantz**
Co-Chair: **Galina Ivanova**
Scientific Secretary: **Yuksel Aliev**

**Friday, 14th September 2018**
**9:00 – 11:30**
**New building, Hall 2.207**

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

1. **Integration of MOOCs in Regular Courses**
   *Leon Rothkrantz*

2. **Matlab-based Software Tool for Implementation of Digrafid Ciphers Using a Modified Algorithm With 64-Symbol Alphabet**
   *Adriana Borodzhieva, Plamen Manoilov*

3. **Risks management in software development capstone projects**
   *Pekka Mäkiaho, Timo Poranen*

4. **Iconic framework for cooperative coding**
   *Guido Averna, Biagio Lenzitti, Davide Taibi, Domenico Tegolo*

5. **Computer vision and Internet of Things: Attention System in educational context**
   *Teodor Savov, Valentina Terzieva, Katia Todorova*

6. **Robotic Interaction for Assistance to Autistic Children**
   *Manolo Dulva Hina, Assia Soukane, Amar Ramdane-Cherif, Galina Ivanova*

**DISCUSSIONS**

**11:30 – 12:00**
**2.203**
**Coffee Break**

# Session E

Chair: **Amar Ramdane-Cherif**
Co-Chair: **Galina Ivanova**
Scientific Secretary: **Yuksel Aliev**

**Friday, 14th September 2018**
**12:00 – 14:00**
**New building, Hall 2.207**

**THE YOUTH AND THE ICT**

1. **Science Clash**
   *Viktor Toporov, Kristian Spasov, Syuzan Feimova*

2. **Innovative rehabilitator for children with moving problems**
   *Monika Velikova, Selin Shemsieva, Syuzan Feimova*

**DISCUSSIONS**

**14:00**
**Hall 2Г.204 SIEMENS**
**THE BEST PAPERS AWARDS**

**Friday, 14th September 2018**
**14:00**
**New building, Hall 2Г.204 SIEMENS**
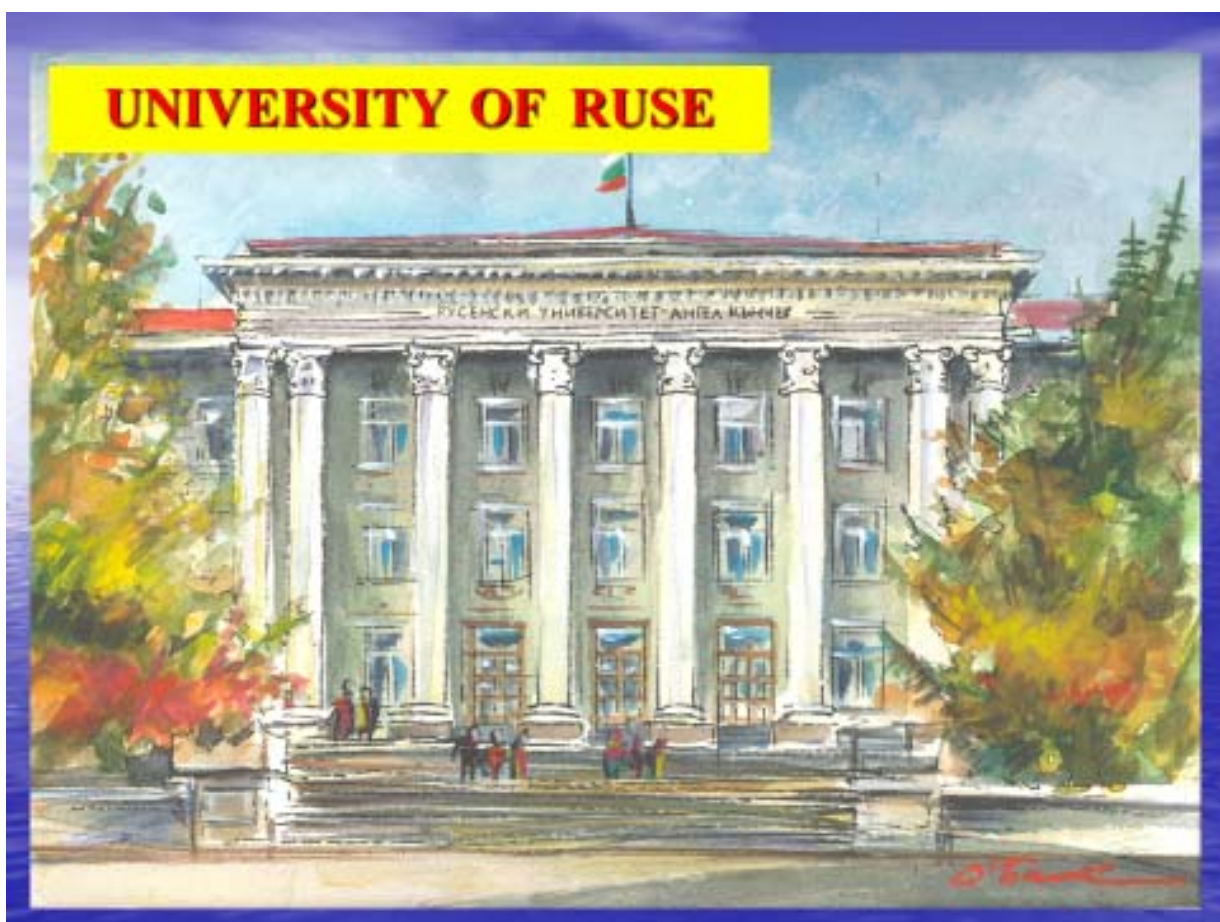
**The CHAIRS**
**of the PROGRAMME COMMITTEE**
**and**
**the ORGANIZING COMMITTEE**
**will bestow**
**a CRYSTAL PRIZE**
**to the authors of the best papers.**



**Friday, 14th September 2018**
**14:30**
**New building, Hall 2Г.204 SIEMENS**

**Meeting**
**of the PROGRAMME COMMITTEE and ORGANIZING COMMITTEE**
**and the chairs of each sections**
**of the CompSysTech'18**
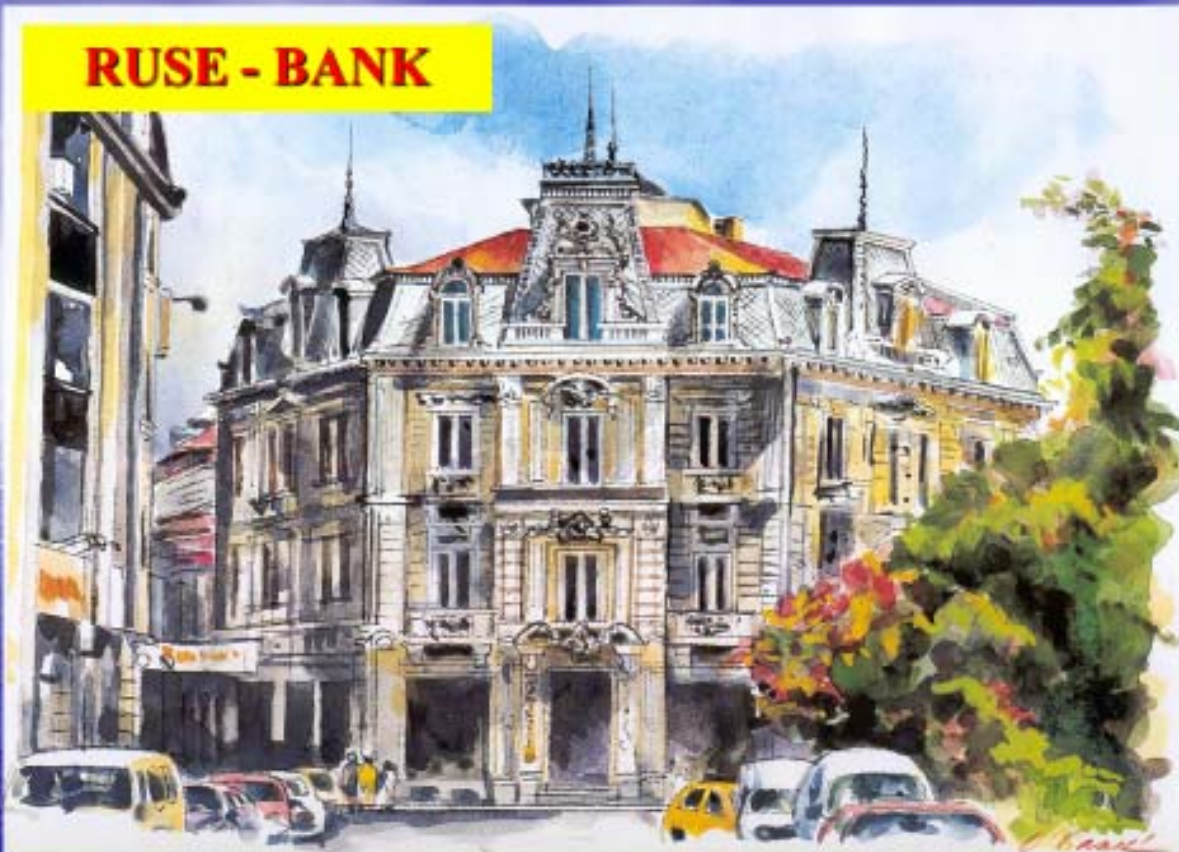
## Paintings from RUSE

**N O T E S**

**N O T E S**

# N O T E S