

Program of the Fifth International Conference

# **ICNNAI-2008**

## **Neural Networks and Artificial Intelligence**

27-30 May 2008 Minsk, Belarus

Belarus, Minsk

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# Contributors to ICNNAI'2008

Conference is organized by:

- Ministry of Education (Belarus)
- Belarusian State University of Informatics and Radioelectronics (BSUIR)
- Belarus Special Interest Group of International Neural Network Society

in cooperation with:

- Brest State Technical University (Belarus)
- United Institute of Informatics Problems (UIIP NASB),
- NovaLab Ltd.
- Joint Venture “International Business Alliance Inc.”
- Effective Software Ltd.
- Belhard Development Ltd.
- Exadel Inc.
- Enterprise “SKIB”
- Belarusian Association for Image Analysis and Recognition (BAARI)

and supported by Belarusian Republican Foundation for Fundamental Researches

## Section list

- A Neural Networks Technology
- B Speech Recognition and Signal Processing
- C Cognitive Science
- D Pattern Recognition and Image Processing
- E Simulation and Modeling
- F Decision Making and Optimization
- G Neural Networks Applications

# Time shedule

## Monday, May 26, 2008

16:00 – 18:00	Registration
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## Tuesday, May 27, 2008

08:00 – 10:00	Registration	
10:00 – 10:20	Welcome	
10:20 – 11:20	Plenary Session	
11:20 – 11:40	Coffee Break	
11:40 – 12:40	A1	C1
12:40 – 14:00	Launch	
14:00 – 15:00	Plenary Session	
15:00 – 15:20	Coffee Break	
15:20 – 16:40	A2	E1
16:40 – 17:00	Coffee Break	
17:00 – 18:00	D1	E2
18:30 – 22:00	Conference Banquet	

## Wednesday, May 28, 2008

09:00 – 10:00	Plenary Session	
10:00 – 10:20	Coffee Break	
10:20 – 11:20	B1	F1
11:20 – 11:40	Coffee Break	
11:40 – 12:40	B2	F2
12:40 – 14:00	Launch	
14:00 – 15:00	Plenary Session	
15:00 – 15:20	Coffee Break	
15:20 – 16:20	D2	C2
16:20 – 16:40	Coffee Break	
16:40 – 18:00	D3	G1
19:00 – 22:00	“Prince Igor”, Opera by Alexander Borodin	

### **Thursday, May 29, 2008**

09:00 – 10:00	Plenary Session	
10:00 – 10:20	Coffee Break	
10:20 – 11:20	D4	G2
11:20 – 11:40	Coffee Break	
11:40 – 12:40	D5	G3
12:40 – 14:00	Launch	
14:00 – 15:00	Plenary Session	
15:00 – 15:20	Coffee Break	
15:20 – 16:20	C3	
16:20 – 16:40	Coffee Break	
16:40 – 17:40	F3	
17:40 – 18:10	Closing ceremony, award presentation	
19:00 – 22:00	“Esmeralda”, Ballet by Jules Perrot	

### **Friday, May 30, 2008**

10:00 – 12:00	Visit to Laboratories of BSUIR
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# Scientific program

**Tuesday, May 27, 2008**

08:00 – 10:00 **Registration**

10:00 – 10:20 **Welcome**

Mikhail Batura, Rector of BSUIR

Sergey Ablameyko, Vice-President of IAPR, General Director of UIIP NASB

Rauf Sadykhov, Head of Computer Science Dept. of BSUIR

10:20 – 11:20 **Plenary Session**

*Jean-Jacques Mariage*<sup>1</sup>

Neural Networks: Towards Self-Adaptive Developmental Systems

11:20 – 11:40 **Coffee Break**

11:40 – 12:40

**A1 Neural Networks Technology**

**Chairman: Armagan Tarim**

*Aleksej Otwaġin*

A Multiagent System for Reliable and Efficient Parallel Computing

*Dmitri A. Viattchenin*

Fuzzy Objective Function-Based Technique of Partial Supervision  
for a Heuristic Method of Possibilistic Clustering

*Amine Chohra, Arash Bahrammirzaee, Kurosh Madani*

Negotiation Agent Behaviors Based On Reinforcement Learning  
Approaches and Fuzzy ArtMap Neural Networks

**C1 Cognitive Science**

**Chairman: Valdimir Golenkov**

*George Losik*

Finger Touch Text Scanning for Insonation of the Words on Special Plane-Table

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<sup>1</sup>CSAR research group, AI Laboratory, Paris 8 University, 2, rue de la Libert, St Denis, France, Cdx 93526, [jjmariage@free.fr](mailto:jjmariage@free.fr)

*Anastasia Leontyeva, Ildar Kagirov*

SMART: Syntax and Morphology Analyzer for Russian Texts

*Inna V. Pasechnik, Alexander V. Vartanov*

Audiovisual integration: the experimental facts and neurocomputer modeling

*O. G. Berestneva, K. A. Abunawas*

Information Technology- Assessment of Competence of Technical University Students

12:40 – 14:00 **Launch**

14:00 – 15:00 **Plenary Session**

*Vladimir Red'ko*<sup>2</sup>

Towards Modeling Cognitive Evolution

15:00 – 15:20 **Coffee Break**

15:20 – 16:40

## **A2 Neural Networks Technology**

**Chairman: Vladimir Golovko**

*H. Hasanov, T. Suleymanov, E. Gambarova*

An investigation of the design and use of artificial neural networks in the classification of remotely sensed images

*El khier Bouyoucef, Ivan Budnyk, Abdennasser Chebira, Kurosh Madani*

A Modular Neural Classifier with Self-Organizing Learning: Performance Analysis

*Vladimir Golovko, Leanid Vaitsekhovich*

Boosting Algorithms for Ensembles of Neural Network Classifiers in Intrusion Detection Domain

*Matthieu Voiry, Kurosh Madani, Véronique Amarger, Joël Bernier*

Problem Decomposition Driven by Local Intrinsic Dimension for Neural Networks Based Classification

## **E1 Simulation and Modeling**

**Chairman: Dmitri A. Viattchenin**

*E. Shestakov, Yu. V. Pottosin*

A Boolean Function for Polygon Representation

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<sup>2</sup>Institute of Optical Neural Technologies, Russian Academy of Science. 44/2 Vavilova st, Moscow, 119333, Russia, [http://www.niisi.ru/iont/staff/rvg/index\\_eng.php](http://www.niisi.ru/iont/staff/rvg/index_eng.php) redko@keldysh.ru

*Nicholas A. Nechval, Konstantin N. Nechval, Irina Bausova, Gundars Berzins, Maris Purgailis, Daina Skiltere, Vladimir F. Strelchonok*  
Recognition of Changes in Regression Relationships Over Time

*Nicholas A. Nechval, Konstantin N. Nechval, Irina Bausova, Gundars Berzins, Maris Purgailis, Daina Skiltere, Vladimir F. Strelchonok*  
Pivotal Quantity Approach to Recognition of Statistical Validity of Simulation Models

*Maryia A. Ryzhankova*

Modeling of a Structure of a Legislative Institution of the Republic of Belarus Based on Fuzzy Clustering: A Comparative Study

16:40 – 17:00 **Coffee Break**

17:00 – 18:00

## **D1 Pattern Recognition and Image Processing**

**Chairman: Aleksej Otwagin**

*Tofiq Hasanaqa oqli Kazimov, Shafaqat Jabrail qizi Mahmudova*

About Creation of System of Computer Recognition of People by Photographs

*Nick Ivanov, Evgen Marchenko*

Landmark Warping of Human Brain Images of Different Modalities with Orthogonal Functions

*Alexander Inyutin*

The Operators of Soft Morphology for Image Filtration

## **E2 Simulation and Modeling**

**Chairman: Maksim Vatkin**

*Maksim Vatkin, Elena Vatkina*

Development of The Data Mining Algorithm of Dynamic Scene System

*Levon Avakyan, Tatsiana Lemesheva*

Building Non Player Characters Behavior On Fuzzy Finite-State Machine

*Borys O. Kapustiy, Bohdan P. Rusyn, Vitaliy A. Tayanov*

Reliability Estimation of the 1NN Classifier under Information Class Coverage Reduction on the Basis of Combinatorial Approach



## **Wednesday, May 28, 2008**

09:00 – 10:00 **Plenary Session**

*Robert E. Hiromoto*<sup>3</sup>

A Small World without Random Graphs

10:00 – 10:20 **Coffee Break**

10:20 – 11:20

### **B1 Speech Recognition and Signal Processing**

**Chairman: Alexander Petrovsky**

*Alexey Karpov, Boris Lobanov, Andrey Ronzhin, Liliya Tsirulnik*

Audio-Visual Russian Speech Recognition and Synthesis for a  
Multimodal Information Kiosk

*Thai Trung Kien*

Parameters Estimation and Voice Conversion System base on  
Gaussian Mixture Model

*Alexander Rylov*

Adaptable Method of Two-Level Speaker-Independent Speech  
Recognition

### **F1 Decision Making and Optimization**

**Chairman: Tadeusz Witkowski**

*Vasilij Shut, Aksana Vaitsekhovich*

Intellectual Traffic Control on An Adjustable Crossroads

*A. Zakrevskij, V. Romanov*

Tasks of Logical Recognition in System LOGIC

*S. G. Charny, L. I. Minchenko*

Solving maximin problem by decomposition to smooth and non-  
smooth problems

*Akira Imada*

What We Can Do for Jeep in a Desert: Which is Cleverer –  
Human or Learning-Machine?

11:20 – 11:40 **Coffee Break**

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<sup>3</sup>Department of Computer Science University of Idaho, Moscow, Idaho 83844-1010, USA,  
<http://www.cs.uidaho.edu/Faculty/Hiromoto.html>, [hiromoto@cs.uidaho.edu](mailto:hiromoto@cs.uidaho.edu)

11:40 – 12:40

## **B2 Speech Recognition and Signal Processing**

**Chairman: Alexey Petrovsky**

*M. Livshitz, A. Petrovsky, A. Stankevich, M. Kachinsky, A. Petrovsky*  
Embedded Reconfigurable Hardware Platform for Real-Time Audio and Speech Signal Processing

*Elias Azarov, Alexander Petrovsky*  
Continuous Representation of the Discrete Signal in the Frequency Domain

*Vitaly Kluchenny, Alexander Petrovsky*  
DCT Processors Structural Decisions and their Implementation for Embedded Real-Time Multimedia System

## **F2 Decision Making and Optimization**

**Chairman: Victor V. Krasnoproshin**

*G. Shakah, V. V. Krasnoproshin, A. Valvachev*  
Fuzzy Approach to Active System Management

*Tadeusz Witkowski, Paweł Antczak, Arkadiusz Antczak*  
An Knowledge-Base System for Solve of Production Scheduling Problems

*Mohammad Ali Dashti*  
A Hybrid Evolutionary Algorithm for Portfolio Optimization

12:40 – 14:00 **Launch**

14:00 – 15:00 **Plenary Session**

*Antanas Žilinskas<sup>4</sup>*  
Visualization Aided Optimization and Optimization Aided Visualization

15:00 – 15:20 **Coffee Break**

15:20 – 16:20

## **D2 Pattern Recognition and Image Processing**

**Chairman: Nick Ivanov**

*Vadim Kharlanov*  
Context based Dactyloscopic Image Registration Algorithm

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<sup>4</sup>Institute of Mathematics and Informatics 4 Akademijos st, Vilnius, LT-08663, Lithuania,  
[http://www.mii.lt/mii\\_staff/zilinsk.htm](http://www.mii.lt/mii_staff/zilinsk.htm), [antanasz@ktl.mii.lt](mailto:antanasz@ktl.mii.lt)

*R. Bogush, N. Brovko, S. Maltsev*

Background Reconstruction Based on Iterative Algorithm for  
Video Surveillance Systems

*Nikolay Chumerin, Marc M. Van Hulle*

Ground Plane Estimation Based on Dense Stereo Disparity

## **C2 Cognitive Science**

**Chairman: George Losik**

*Alexander V. Vartanov, Elena A. Malyasova*

Perception of Constant Personal Depositions Depending on Emo-  
tional Expression Variability of Female Face

*Nikolay Yerchak*

The Role of Inner Speech in Text Comprehension

*Valery Scyrochin, Vadym Mukhin*

Functionally Oriented Processors-Cartoids as Brain-Like Models  
of Human Conscious

16:20 – 16:40 **Coffee Break**

16:40 – 18:00

## **D3 Pattern Recognition and Image Processing**

**Chairman: Kamel Rouibah**

*D. A. Bespalov*

Calculation of the Optimal Layout of Camera and Projector in  
3D Image Formation Tasks with Help of Structured Lighting

*E. Shestakov, A. Butov, T. Orlova, A. Voronov*

The Automated System of Input Data Preparation for Integrated  
Circuit Layout Generators

*Roman Melnyk, Ruslan Tushnytskyi*

Pattern Analysis by Clustering

## **G1 Neural Networks Applications**

**Chairman: Vladimir Rubanov**

*A. Borovyi, V. Kochan, V. Turchenko, A. Sachenko, Th. Laopoulos*

Neural-Based Prediction of Power Consumption of Data-  
processing Instructions

*Iryna Turchenko, Volodymyr Kochan, Anatoly Sachenko*

Neural-Network Based Method of Control Influence Forming for  
Section of Mine Ventilation Network

*Dzmitry Kaliukhovich, Vladimir Golovko, Andreas Paczynski*

Some Approaches to the Task of Path Following Based on Neural Networks and Fuzzy Logic

*Nikolay Kostin, Vladimir Golovko, Vladimir Rubanov*

Neural Network Methods Of Forecasting Of Economic Indicators

## **Thursday, May 29, 2008**

09:00 – 10:00 **Plenary Session**

*Hubert Roth<sup>5</sup>*

Reactive Neural Control for Autonomous Robots: From Simple Wheeled Robots to Complex Walking Machines

10:00 – 10:20 **Coffee Break**

10:20 – 11:20

### **D4 Pattern Recognition and Image Processing**

**Chairman: Irina Bausova**

*Valentin Ganchenko, Albert Petrovsky, Boleslav Sobkowiak*

Joint Segmentation of Aerial Photographs with the Various Resolutions

*Dmitry A. Bushenko, Rauf Kh. Sadykhov*

Segmentation of Extensive Objects on Low-Contrast Images

*Denis V. Lamovsky, Rauf Kh. Sadykhov*

Stereo-Faces Detection for Video Surveillance in Real Time

### **G2 Neural Networks Applications**

**Chairman: Kurosh Madani**

*M. M. Lukashevich, Rauf Kh. Sadykhov*

Synthesis of a Self-Organizing Neural Network in a Problem of Clustering of Gray Scale Remote Sensing Image Data

*Ivan Budnyk, El khier Bouyoucef, Abdennasser Chebira, Kurosh Madani*

A Hybrid Multi Neural Network Structure Optimization Handled by a Neurocomputer Complexity Estimator

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<sup>5</sup>Department of Electrical Engineering and Computer Science, Institute of Automatic Control Engineering (RST), Siegen, Germany, [hubert.roth@uni-siegen.de](mailto:hubert.roth@uni-siegen.de), <http://www2.uni-siegen.de/rst/rst/index.e.php?page=roth/rothHome.e.html>

*Aleksandr Doudkin, Maksim Vatin*

Neocognitron-Like Multilayer Neural Network for Halftone Images Recognition

11:20 – 11:40 **Coffee Break**

11:40 – 12:40

## **D5 Pattern Recognition and Image Processing**

**Chairman: Vitaly Kober**

*Vitaly Kober, I. A. Ovseevich*

Design of Correlation Filters with a Training Algorithm for Detection of Object Fragments

*L. A. Belozerskiy, L. V. Areshkina*

Histograms of Satellite Images and Status of Objects

*Mehdi Chehel Amirani, Ali Asghar Beheshti Shirazi*

Robust Texture Image Retrieval Based on Cyclic Spectral Analysis

## **G3 Neural Networks Applications**

**Chairman: Anatoly Sachenko**

*Weiwei Yu, Christophe Sabourin, Kurosh Madani, Jie Yan*

CMAC Neural Networks Structure Optimization for Function Approximation

*Mehdi Chehel Amirani, Zahra Sadeghi Gol, Ali Asghar Beheshti Shirazi*

Shape-Based Image Retrieval Using a Neural Network

*Sergei Bezobrazov, Vladimir Golovko*

Neural Networks and Artificial Immune Systems – Malware Detection Tool

12:40 – 14:00 **Launch**

14:00 – 15:00 **Plenary Session**

*Janusz Zalewski<sup>6</sup>*

Combining Bayesian Networks and Rough Sets: A New Approach to Reasoning about Uncertainty

15:00 – 15:20 **Coffee Break**

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<sup>6</sup>Florida Gulf Coast University, Ft. Myers, FL 33965-6565, USA,  
<http://itech.fgcu.edu/faculty/zalewski/> [zalewski@fgcu.edu](mailto:zalewski@fgcu.edu)

15:20 – 16:20

**C3 Cognitive Science**

**Chairman: Alexander V. Vartanov**

*Kamel Rouibah, Sulaiman Al-Rafee, Samia Ould-Ali*

System Development in Kuwait: State of Requirement Engineering Practices

*George Losik*

A New Type of Perceptive Actions

*Svetlana Bezobrazova, Vladimir Golovko*

Adaptive Segmentation of Electroencephalogram Signals Based on Neural Networks

16:20 – 16:40 **Coffee Break**

16:40 – 17:40

**F3 Decision Making and Optimization**

**Chairman: Vladimir I. Donskoy**

*Ingrida Radziukynienė, Antanas Žilinskas*

Comparison of Heuristic Methods in Multi-Objective Portfolio Optimization Problem

*V. V. Krasnoproshin, E. P. Maksimovich*

Decision Making in Distributed Corporate Environment

*Vladimir I. Donskoy*

The Estimations Based on the Kolmogorov Complexity and Machine Learning from Examples

17:40 – 18:10 **Closing ceremony, award presentation**

**Friday, May 30, 2008**

10:00 – 12:00 **Visit to Laboratories of BSUIR**

## **Conference Place and Addrsses**

Belarussian State University of Informatics and Radioelectronics  
6 P. Brovki st, Minsk, 220027 Belarus  
tel: +375 17 293 2379  
fax: +375 17 293 2380  
e-mail: [icnnai@lsi.bas-net.by](mailto:icnnai@lsi.bas-net.by)

## **Information about Hotels**

An accomodation is available in 4 hotels: Minsk, Belarus, Octyabrskiy, and Academicheskaya (from four stars Minsk to econimic Academicheskaya).

## **Public Transport in Minsk**

Public Transport in Minsk are micsobuses, buses, trams, troleybuses, and underground. Tickets on buses, trams, troleybuses, and underground should be bought in advance at underground stations or in ticket kiosk. Tickets on micsobuses are bought at place.

## **Instruction for Oral Presentation**

Speakers are requested to meet their session chair 10 minutes before the session starts. Oral Presentation is limited to 20 minutes and includes a few minutes fot discussion. The lecturing halls are equipped with overehad and multimedia projectors. The language of oral presentation is English.