

Program of the Fifth International Conference

ICNNAI-2008

Neural Networks and Artificial Intelligence

27-30 May 2008 Minsk, Belarus

Belarus, Minsk

Committees ICNNAI-2008

Honorary Chair:

Mikhail Batura (Belarus)

General Chair:

Rauf Sadykhov (Belarus)

Co-chairs:

Kuznetsov Alexander (Belarus)

Vladimir Golovko (Belarus)

International Program Committee

Akbar Shahsavand (Iran)

Akira Imada (Japan)

Alessandro E. P. Villa (Switzerland)

Alexander Dorogov (Russia)

Alexander Galushkin (Russia)

Alexander Petrovsky (Belarus)

Anatoly Sachenko (Ukraine)

Andreas Matt (Austria)

Antanas Zilinskas (Lithuania)

Boris Velitchkovsky (Germany)

Carlo Morabito (Italy)

Colin Fyfe (United Kingdom)

Darryl Davis (United Kingdom)

Dmitry Gorodnichy (Canada)

Donald Wunsch (USA)

George Losik (Belarus)

Helmut Mayer (Austria)

Herwig Unger (Germany)

Hubert Roth (Germany)

Ian Cloete (Germany)

Irina Bausova (Latvia)

Jean-Jacques Mariage (France)

Jon A. Benediktsson (Iceland)

Juan Miguel Santos (Argentina)

Kurosh Madany (France)

Leon Bobrowski (Poland)

Lucio Grandinetti (Italy)

Marco Gori (Italy)

Nicola Kasabov (New Zealand)

Qiangfu Zao (Japan)

Robert Hiromoto (USA)

Sarunas Raudys (Lithuania)

Sebastiano B. Serpico (Italy)

Sergey Ablameyko (Belarus)

Stanislav Sedukhin (Japan)

Tapio Saramaki (Finland)

Tom Downs (Australia)

Vera Kurkova (Czechia)

Victor Krasnoproschin (Belarus)

Vincenzo Piuri (Italy)

Vladimir Golenkov (Belarus)

Vladimir Rubanov (Belarus)

Vlad Shmerko (Canada)

Organizing Committee

Alexander Doudkin – Chair

Sergey Bayrak

Valentin Ganchenko

Alexander Inyutin

Valery Ivkovich

Eugeniy Kalabukhov

Denis Lamovsky

Marina Loukasheviuch

Aleksey Otvagin

Leonid Podenok

Andrey Uvarov

Alexander Voronov

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 schedule

Monday, May 26, 2008

16:00 – 18:00	Registration
---------------	--------------

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
---------------	--------------------------------

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*¹

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 Otwagin

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 Spe-
cial Plane-Table

¹CSAR research group, AI Laboratory, Paris 8 University, 2, rue de la Libert, St Denis, France,
Cdx 93526, 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'ko²

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, Leonid 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

²Institute 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 redko@keldysh.ru

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

Nicholas A. Nechval, Konstantin N. Nechval, Irina Bausova, Gundars Berzins, Maris Purgailis, Daina Skilttere, 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 Lemeshova

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. Hiromoto³

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 Rylow

Adaptable Method of Two-Level Speaker-Independent Speech
Recognition

F1 Decision Making and Optimization

Chairman: Tadeusz Witkowski

Vasiliy 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

³Department of Computer Science University of Idaho, Moscow, Idaho 83844-1010, USA,
<http://www.cs.uidaho.edu/Faculty/Hiromoto.html>, 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 Kluchanya, 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 Žilinskas⁴

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

⁴Institute of Mathematics and Informatics 4 Akademijos st, Vilnius, LT-08663, Lithuania,
http://www.mii.lt/mii_staff/zilinsk.htm, 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 Tushnytskyy

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*⁵

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

⁵Department of Electrical Engineering and Computer Science, Institute of Automatic Control Engineering (RST), Siegen, Germany, hubert.roth@uni-siegen.de, http://www2.uni-siegen.de/rst/rst/index_e.php?page=roth/rothHome_e.html

Aleksandr Doudkin, Maksim Vatkin

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. Belozerskyy, 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 Zalewski⁶

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

15:00 – 15:20 **Coffee Break**

⁶Florida Gulf Coast University, Ft. Myers, FL 33965-6565, USA,
<http://itech.fgcu.edu/faculty/zalewski/> 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. Krasnoproschin, 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 Addresses

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

Information about Hotels

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

Public Transport in Minsk

Public Transport in Minsk are micsobuses, buses, trams, trolleybuses, and underground. Tickets on buses, trams, trolleybuses, 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 for discussion. The lecturing halls are equipped with overhead and multimedia projectors. The language of oral presentation is English.