Organized by

United Institute of Informatics Problems of the National Academy of Sciences of Belarus

In cooperation with

- National Academy of Sciences of Belarus
- Belarusian State University
- Belarusian State University of Informatics and Radioelectronics
- Belarusian Association for Image Analysis and Recognition
- EPAM Systems

20 Years of Excellence in Software Engineering

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Scientific Program

Wednesday, May 28

8:00 – 10:00	**Registration of participants**
10:00 – 10:15	**Opening**

Session: IMAGE PROCESSING

Chairman: Valery Starovoitov

10:15 – 10:30	**Starovoitov V.** Image processing for fundus image analysis
10:30 – 10:45	**Klionskiy D.M., Kaplun D.I., Voznesenskiy A.S., Gulvanskiy V.V.** Study of digital filter banks and their software-hardware implementations for wideband monitoring
10:45 – 11:00	**Zalesky B.A., Seredin E.N.** Interactive extraction of roads and rivers in low resolution or noisy satellite images
11:00 – 11:15	**Hancharou D., Nedzved A., Ablameyko S.** Skeletonization algorithm of high resolution vascular data
11:15 – 11:30	**Kharinov M.** Hierarchical pixel clustering for image segmentation
11:30 – 11:45	***Coffee break***

Chairman: Eduard Snezhko

11:45 – 12:00	**Khorev I.E., Zelepugin S.A., Tolkachev V.F., Zelepugin A.S.** Image analysis in high-velocity interaction of a group of bodies with a target
12:00 – 12:15	**Ganchenko V., Doudkin A., Petrovsky A.** Decision support for precision farming complex
12:15 – 12:30	**Krasnoproshin V., Mazouka D.** High-level rendering pipeline construction tools
12:30 – 12:45	**Lisitsa Y., Yatskou M., Apanasovich V., Apanasovich T.** Studying the advanced segmentation methods with the computer-simulated images
12:45 – 13:00	**Dorogov A.Yu.** Fractal learning of fast orthogonal two-dimensional transformations
13:00 – 13:15	**Murashov D.** Application of structure tensor features for describing an artistic manner
13:15 – 14:45	***Lunch***

Session: SPEECH AND SIGNAL PROCESSING, PATTERN RECOGNITION

Chairman: Boris Zalesky

14:45 – 15:00	**Hetsevich Yu., Mandzik V., Rusak V., Hiuntar A., Okrut T., Lobanov B., Lysy S., Dzenisiuk Dz.** The system of generation of phonetic transcriptions for input electronic texts in Belarusian
15:00 – 15:15	**Kliuchenia V., Petrovsky A.** Architecture of the DCT-IDCT processor for lossless scheme coding
15:15 – 15:30	**Zahariev V., Petrovsky A.** Multivoice text to speech synthesis system
15:30 – 15:45	**Viattchenin D.A., Damaratski A., Nikolaenya E., Shyrai S.** An outline for an approach to automatic labeling for interpretation of heuristic possibilistic clustering results
15:45 – 16:00	**Gladun A., Rogushina J., Andrushevich A., Kurbatski A.** User-oriented recognition of intelligent information objects in distributed dynamic informational web-space
16:00 – 16:30	***Coffee break and Poster Teasers*** (1 minute oral presentation of each poster)

Chairman: Alexei Belotserkovsky

16:30 – 16:45	**Snezhko E., Kharuzhyk S., Tuzikov A., Kovalev V., Safonau I.** A scheme for nodules detection on CT images of lungs
16:45 – 17:00	**Bobkov A., Gafurov S., Krasnoproshin V., Romanchik V., Vissia H.** Information extraction based on semantic patterns
17:00 – 17:15	**Strelchonok V.F., Moldovan M.** Statistical validation of simulation models
18:00	***Conference dinner***

Thursday, May 29

Session: BIG DATA and DATA ANALYSIS

Chairman: Alexander Tuzikov

9:30 – 10:15	**Plenary lecture: Slava Lazebnikov (USA)** Vice-president, Technology solutions, EPAM Systems
10:15 – 10:30	**Kharin Yu., Zhurak M.** Statistical analysis of spatio-temporal data by poisson conditional autoregressive model
10:30 – 10:45	**Faizullin R.T., Ogorodnikov Y.Y.** Recognition of zero bits of 3-sat problem by applying linear algebra's methods
10:45 – 11:00	**Abaturov V., Dorogov Yu.** The knowledge extraction analytical platform for embedded industrial applications
11:00 – 11:15	***Coffee break***

Chairman: Alexander Doudkin

11:15 – 11:30	**Krasnoproshin V., Obraztsov V., Vissia H., Nguyen Q.T.** Data mining and knowledge-based technology
11:30 – 11:45	**Sidorenko A.V., Shakinko I.V.** The modified principal component analysis of information encrypted using deterministic chaos
11:45 – 12:00	**Kotov V.** About new specialty "Algorithms and systems for Big Data processing" within in-depth training Master's studies provided by Faculty of Applied Mathematics and Computer Science, BSU
12:00 – 12:15	**Strelchonok V.F., Moldovan M.** Distance-based embedding procedures for pattern classification
12:15 – 12:30	**Britenkov A., Dokuchaev A.** Structure-functional approach to modulating function trend estimation based on time-series data under uncertain conditions
12:30 – 12:45	**Dvoenko S.** Meanless *k*-means as *k*-meanless clustering with the bi-partial approach
12:45 – 14:45	***Lunch***

14:45 – 15:30	**Plenary lecture: Prof. Jürgen Hesser (Germany)** Head of Radiation Oncology, University of Heidelberg

Session: MEDICAL IMAGE PROCESSING

Chairman: Vassili Kovalev

15:30 – 15:45	**Liauchuk V.A., Snezhko E.V.** A method for coarse segmentation of pathological lungs on CT images using ribcage
15:45 – 16:00	**Sergeev R.S., Tuzikov A.V., Kavaliou I.S.** Mutation analysis of genetic sequences and building mutational database in context of tuberculosis treatment
16:00 – 16:15	**Abramovich M., Mitskevich M.** Spatio-temporal cluster analysis of disease
16:15 – 16:30	***Coffee break***

Chairman: Mikhail Kovalyov

16:30 – 16:45	**Mashtalir S., Mikhnova O.** Video content analysis and key frame extraction method
16:45 – 17:00	**Nedzved A., Belotserkovsky A., Khmelkov A.** System for automatic parallelization of processing large volumes of images using multi-user resources
17:00 – 17:15	**Dimitrakopoulos G.** Reconfiguring driving styles based on bayesian networking principles

Friday, May 30

9:30 – 10:15	**Plenary lecture: Prof. Henning Müller (Switzerland)** HES-SO Valais, Technopôle 3, Sierre, and the University hospital of Geneva
	Chairman: Vassili Kovalev
10:15 – 11:00	**Plenary lecture: Prof. dr. Bram van Ginneken (the Netherlands)** Head of Diagnostic Image Analysis, Radboud University Medical Center, Nijmegen
11:00 – 11:15	***Coffee break***
11:15 – 13:15	**Software demonstration** Moderator Eduard Snezhko
13:15 – 14:45	***Lunch***
14:45	***Culture Program***

Poster Session

1. **Batmunkh Amar.** State space representation of multi-input multi-output circuits.
2. **Makovetskii A., Kober V.** Frequency analysis of gradient descent method for image restoration.
3. **Miramontes-Jaramillo D., Kober V., Karnaukhov V.** Fast image matching with sliding hogs.
4. **Orlov A.A., Astafiev A.V., Popov D.P.** Development of algorithm for localization of symbolic with the use of analysis of the color map.
5. **Alexandrov O., Svirsky D., Radoman N.** Modeling of flow distribution in electric network taking into account the uncertain factors.
6. **Lisitsa Y., Yatskou M., Skakun V., Digris A., Shingaryov I., Apanasovich V.** Simulation model to study denoising methods.
7. **Shut O.** The complexity of inductive resolution algorithms in pattern recognition problems.
8. **Sychyou U.** Method of mobile-robot control to implement search motion.

9. **Paringer R.A., Kupriyanov A.V.** Research methods for classification of the crystallograms images.

10. **Trukhan S., Nedzved A., Ablameyko S.** Region growing segmentation of CT-image by the analysis of 3D local neighborhood.

11. **Pshenichny D., Dvoenko S.** Elimination of the non-positive definiteness of matrices of pairwise comparisons.

12. **Kanonik D.** Distinguishing mental activity types by electroencephalography records.

13. **Mamaev N., Lukin A., Yurin D.** HENLM-3D: A 3D computer tomography image denoising algorithm.

14. **Volkovich A.** Use of color characteristics and gradient field data in disparity map building process.

15. **Evsutin O., Shelupanov A.** Creating of the discrete orthogonal transformations with the use of cellular automata dynamics.

16. **Shangytbayeva G.** Planning of the enterprise resources.

17. **Nedzvedz O., Ablameyko S.** Detection patterns of living cells from its aggregation on the digital image.

18. **Zakharov A., Tuzhilkin A., Zhiznyakov A.** Algorithm of automatic reconstruction of three-dimensional objects for CAD-systems.

19. **Shestov A., Kumskov M.** Multiscale molecular surface descriptors.

20. **Polyakova G.** Logical-and-probability simulation model of data processing and analysis.

21. **Karkanitsa H.** Development of domain-specific language for constructing dynamic subject domains.

22. **Losik G., Brazevich H.** Brain coding of information on the object shape by its physical model.

23. **Yerchak M.** Oral speech: how much information is hidden behind.

24. **Bat-Erdene B., Ganbat Ts.** Computer model for distinguishing Asian people by face.

25. **Viattchenin D.A., Damaratski A., Yaroma A.** New parameters for relational heuristic algorithms of possibilistic clustering.

26. **Kuzmich A.I.** Standartization of mobile heterogeneous objects monitoring based on pattern recognition.

27. **Noskov M., Tutatchikov V., Kolcova I.** Three-dimensional Fast Fourier Transform algorithm modification by analogue of Cooley-Tukey.

28. **Kovalev A.** An agent-based model of German-French inter-border residential mobility in Strasbourg region.

29. **Voronov A., Doudkin A.** General covering algorithm in software system for input data preparation for single-beam VLSI layout generator.

30. **Kazlouski A., Sadykhov R.** Plain objects detection in image based on a contour tracing algorithm in binary images.