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Part I CSDEIS2019 Conference Schedule

Oral Session

Friday, 4 October 2019

Time	Activity	Location
9:00-9:30	**Registration**	
9:30-10:00	**Opening Ceremony**	
10:00-10:30	**Keynote Speech: APPLICATIONS OF QUANTUM INFORMATION AND PROBABILITY: COGNITION AND DECISION MAKING** **Speaker:** Prof. A. Yu. Khrennikov	**"Amethyst" conference hall of Moscow Salut Hotel** **Конференц-зал «Аметист» - Гостиница «Салют»**
10:30-11:00	**Keynote Speech: PARALLEL ROBOTS IN MEDICAL AND TRAINING SYSTEMS** **Speaker:** Prof. Victor A. Glazunov	
11:00-11:20	**Coffee Break**	
11:20-11.40	Sergey A. Podkopaev, Sergey S. Gavriushin, Tatiana B. Podkopaeva **Methods for Studying the Post-buckling Behavior of Axisymmetric Membrane -1045**	
11:40-12:00	Vadim Borisov, Vladimir Bobkov, Maxim Dli **Complex Risks Control for Processes in Heat Technological Systems -1080**	
12:00-12:20	Artur Sagdatullin **Development of an Intelligent Control System based on a Fuzzy Logic Controller for Multidimensional Control of a Pumping Station -1099**	
12:20-12:40	Georgy K. Tolokonnikov, Sergey V. Petoukhov **From Algebraic Biology to Artificial Intelligence -1101**	
12:40-13:00	Andrey M. Valuev **Concept of Active Traffic Management for Maximizing the Road Network Usage -1104**	
13:00-13:20	Vladimir A. Mankov, Irina A. Krasnova **Collection of Individual Packet Statistical Information in a Flow based on P4-switch -1108**	
13:20-13:40	A.V. Pavlov **A Model of Cognitive Disorders upon the Algebra of**	

	Fourier-dual Operations -1115
13:40-14:00	**Launch Buffet**
14:00-14:20	Valeriy G. Labunets, Ekaterina Ostheimer **Intelligent OFDM Telecommunication Systems based on Many-parameter Complex or Quaternion Fourier Transforms -1133**
14:20-14:40	Oleg B. Skvorcov, Elena A. Pravotorova **Vibration Monitoring Systems for Power Equipment as an Analogue of an Artificial Neural Network -1139**
14:40-15:00	Yuriy L. Orlov, Anatoly O. Bragin, Roman O. Babenko, Alina E. Dresvyannikova, Sergey S. Kovalev, Igor A. Shaderkin, Nina G. Orlova, Fedor M. Naumenko **Integrated Computer Analysis of Genomic Sequencing Data based on Icgenomics Tool -1144**
15:00-15:20	Nikolay I. Sidnyaev, Iuliia I. Butenko, Elizaveta E. Bolotova **Statistical and Linguistic Decision-making Techniques based on Fuzzy Set Theory -980**
15:20-15:40	Irina V. Gadolina, Andrey A. Bautin, Evgenii V. Plotnikov **Studying the Crack Growth Rate Variability by Applying the Willenborg's Model to the Markov's Simulated Trials -1075**
15:40-16:00	Kang Liang, Karpenko A.P **A Modified Particle Swarm Algorithm for Solving Group Robotics Problem -1085**
16:00-16:20	**Coffee Break**
16:20-16:40	Sergey I. Gavrilenkov, Sergey S. Gavryushin **Development and Performance Evaluation of a Software System for Multi-objective Design of Strain Gauge Force Sensors - 1093**
16:40-17:00	Peter Golubtsov **Optimal Real-time Image Processing with Imperfect Information on Convolution-type Distortion -1109**
17:00-17:20	Peter Golubtsov **Scalability and Parallelization of Sequential Processing: Big Data Demands and Information Algebras -1110**
17:20-17:40	Andrey Gorshenin, Victor Kuzmin **A Machine Learning Approach to the Vector Prediction of Moments of Finite Normal Mixtures -1123**
17:40-18:00	Alexander Kirillovich, Olga Nevzorova, Konstantin Nikolaev, Kamilla

	Galiaskarova **Towards a Parallel Informal/Formal Corpus of Educational Mathematical Texts in Russian -1131**
18:00-20:00	**Welcome Banquet**

Oral Session

Saturday, 5 October 2019

Time	Activity	Location
9:00-9:30	**Keynote Speech:** DIGITAL TRANSFORMATION OF HIGHER EDUCATION VIA COMPUTING **Speaker:** Prof. Matthew He	**"Amethyst" conference hall of Moscow Salut Hotel** **Конференц-зал «Аметист» - Гостиница «Салют»**
9:30-10:00	**Keynote Speech:** DIGITAL ECONOMY, BASIC TECHNOLOGIES OF INDUSTRY 4.0 AND UNDERSTANDING AGENTS **Speaker:** Prof. V.B. Tarassov	
10:00-10:20	Sergey V. Petoukhov **Hyperbolic and Fibonacci Numbers in Modeling Natural Phenomena -1134**	
10:20-10:40	**Coffee Break**	
10:40-11:00	Larisa Kuznetsova, Arthur Zhigalov, Natalia Yanishevskaya, Denis Parfenov, Irina Bolodurina **Application of a Modified Ant Colony Imitation Algorithm for the Traveling Salesman Problem with Time Windows when Designing an Intelligent Assistant -1138**	
11:00-11.20	Matthew He, Z. B. Hu, Sergey V. Petoukhov **Tensor Generalizations of the Fibonacci Matrix -1143**	
11:20-11.40	Bui V. Phuong, Sergey S. Gavriushin, Dang H. Minh, Phung V. Binh, Nguyen V. Duc **Application of a Novel Model "Requirement – Object – Parameter" for Design Automation of Complex Mechanical System -956**	
11.40-12.00	S.B. Makarov, N.V.Pankova **On the Possibility of Applying a Multi-frequency Dynamic Absorber (Mda) to Seismic Protection Tasks -961**	
12:00-12.20	Gouskov A.M., Efimova E.V., Kiselev I.A, Nikitin E.A. **Mathematical Model of Dot Peen Marker Operating in Self-exciting Vibration Mode -984**	
12.20-12:40	Vladimir V. Serebrenniy, Dmitriy V. Lapin, Alisa A. Mokaeva **Study of the Mechanisms of Perspective Flexible Manufacturing System for a Newly Forming Robotic**	

	Enterprise -1051
12:40-13:00	Andrey V. Proletarsky, Ark M. Andreev, Dmitry V. Berezkin, Ilya A. Kozlov, Gennady P. Mozharov, Yury A. Sokolov **Approach to Forecasting the Development of Crisis Situations in Complex Information Networks -1118**
13:00-13:20	Georgy K. Tolokonnikov, Vyacheslav I. Chernoivanov, Sergey K. Sudakov, Yuri A. Tsoi **Systems Theory for the Digital Economy -1120**
13:20-15:00	**Launch Buffet**

Poster Session

Friday, 4 October 2019

Time	Activity	Location
Full day, Friday, 4 October 2019	Fonov D.A., Meshchikhin I.A., Korzhov E.G. **Mathematical Modeling of DC Motors for the Construction of Prostheses -1047** Aleksandr Mezhenin, Vladimir Polyakov, Vera Izvozchikova, Dmitry Burlov, Anatoly Zykov **The Synthesis of Virtual Space in the Context of Insufficient Data -1087** Alexander Mezhenin, Vera Izvozchikova, Vladimir Shardakov **Reconstruction of Spatial Environment in Three-dimensional Scenes -1088** Andrey V. Sukhanov **Railway Rolling Stock Tracking based on Computer Vision Algorithms -1095** Dudnikov Sergey, Mikheev Petr, Grinkina Tatyana **Evaluating of Word Embeddings Hyper-parameters of the Master Data in Russian-language Information Systems -1096** A.P. Eremeev, S.A. Ivliev, O.S. Kolosov, V.A. Korolenkova, A.D. Pronin, O.D. Titova **Creating Spaces of Temporary Features for the Task of Diagnosing Complex Pathologies of Vision -1076** Aleksandr K. Aleshin, Georgy I. Firsov, Viktor A. Glazunov, Natalya L. Kovaleva **Analysis of Diagnostic Signs of Defective States of Mechatronic Mechanisms of Cyclic Action -1090** N.Yu. Mutovkina, V.N. Kuznetsov **Optimization of the Structure of the Intelligent Active System as a Necessary Condition for the Harmonization of Creative Solutions -1097** L.A. Gladkov, N.V. Gladkova, E.Y. Semushin **Parallel Hybrid Genetic Algorithm for Solving Design and Optimization Problems -1106** Artur Azarov, Alena Suvorova, Maria Koroleva, Olga Vasileva **Aggregate Estimates for Probability of Social Engineering Attack Success: Sustainability of the Structure of Access**	**“Amethyst” conference hall of Moscow Salut Hotel** **Конференц-зал «Аметист» - Гостиница «Салют»**

Sunday, 6 October 2019

Time	Activity	Location
10:00-17:00	One-day Tour in Moscow	Moscow

Part II Keynote Speeches

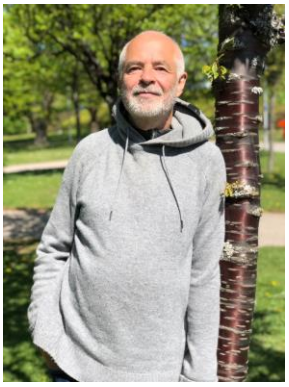
Keynote Speech: APPLICATIONS OF QUANTUM INFORMATION AND PROBABILITY: COGNITION AND DECISION MAKING

Speaker: A. Yu. Khrennikov (International Centre for Mathematical Modelling in Physics, Engineering, Economics, and Cognitive Science, Linnaeus University, Sweden)

Time: 10:00-10:30, October 4, 2019

Location: "Amethyst" conference hall of Moscow Salut Hotel

Конференц-зал «Аметист» - Гостиница «Салют»



Abstract. This talk discusses applications of quantum formalism and methodology (mainly quantum information and probability) to modeling the process of decision-making with applications to cognitive science, social science, and biology. The use of quantum model resolves the basic paradoxes of decision theory, e.g., the Allais (1953), Ellsberg (1961), and Machina (1987) paradoxes. We recall that as early as the 1970s, Tversky (one of the most cited psychologists of all time) and Kahneman (Nobel prize in economics in 2002, for prospect theory, which he co-developed with Tversky) have been demonstrating cases where classical probabilistic prescription and human behavior persistently diverge. They proposed to appeal to heuristic methods, instead of probability theory. The quantum probabilistic description is an alternative to heuristics and classical probability. Statistical data collected in cognitive and social sciences, and economics contain non-classical patters characterized by interference and violation of Bell inequality. Applications to the basic cognitive effects, conjunction, disjunction, and order effects will be discussed with references to experimental data.

Biography

Andrei Yu. Khrennikov, Prof., Dr.Sci.

Current employments: A Professor at the International Centre for Mathematical Modelling in Physics, Engineering, Economics, and Cognitive Science, Linnaeus University, Sweden, and senior researcher at Quantum Cognitivistic Laboratory, ITMO University St. Petersburg, Russia.

He is outstanding Soviet/Russian/Swedish scientist working on multi-disciplinary projects in mathematics-quantum physics-cognitive science-decision making-economics. Prof. Khrennikov was one of the firsts in the world who started (in 1990th) to apply the formalism and methodology of quantum theory (information and probability) outside of physics.

Publications: He is the author of 20 monographs published by Cambridge University Press, Oxford University Press, Springer, Kluwer, World Scientific Publishing (Singapore) and a few other prestigious publishers. Monographs are devoted to foundations of quantum mechanics, quantum information theory and quantum probability as well as their applications to cognitive science, psychology, decision-making, economics, social science. He published around 700 articles in high-ranking journals in mathematics, physics, biology, decision-making, and humanities. (Web of science: citations 6020; H-index 36).

Science administration: Prof. Khrennikov is the organizer of the annual series of conferences on quantum foundations, information, and probability with technological applications. The conferences take place in Växjö, Sweden. The jubilee 20^{th} conference took place this year. These conference series is the longest series of conferences on quantum foundations. It attracts the top experts from whole world, including Nobel Prize Laureates.

See additional information at https://lnu.se/en/staff/andrei.khrennikov/

Keynote Speech: PARALLEL ROBOTS IN MEDICAL AND TRAINING SYSTEMS

Speaker: Victor A. Glazunov, Prof., Sc. D. (Engineering), Sc. D. (Philosophy)

Time: 10:30-11:00, October 4, 2019

Location: "Amethyst" conference hall of Moscow Salut Hotel

Конференц-зал «Аметист» - Гостиница «Салют»

Abstract. The lecture is devoted to the structural synthesis and classification of mechanisms of parallel-sequential structure. Mechanisms of parallel-sequential structure are relatively little investigated and studied. However, on the basis of new 5DOF mechanisms of parallel-sequential structure it is advisable to solve many technical problems. The proposed synthesized mechanisms structures open up prospects for their wider application, in particular, in technological installations, devices for measurement and testing, additive technologies and manipulators of medical purpose. The introduction of additional intermediate links in the synthesized structural circuits of mechanisms, as well as the removal of drives outside the working space, can significantly expand their functional capabilities. This circumstance serves to develop the theory of synthesis and analysis of mechanisms of parallel-sequential structure.

Biography

Victor A. Glazunov, Prof., Sc. D. (Engineering), Sc. D. (Philosophy), outstanding Russian mechanical engineer, well-known in international scientific community for his research in the field of machines and mechanisms theory and robotics, author of more than 350 scientific articles among which there are 9 monographs and about 80 patents and author's certificates.

Current Employments:

Director, A. Blagonravov Mechanical Engineering Research Institute of the Russian Academy of Sciences (IMASH RAN); Professor, N. Bauman Moscow State Technological University (N. Bauman MGTU); Member of Technical Committee on Robotics at International Federation for Promotion of Machines and Mechanisms Science (IFToMM); he conducted research at National Applied Sciences Institute (Renn, France); 15 Ph.Ds. and 1 Sc. D. thesis have been successfully defended under his scientific supervision.

Biography

1980 – graduated from Ivanovo Power Engineering Institute;

1985 – graduated from Post Graduate School of A. Blagonravov Mechanical Engineering Institute; in 1986 – obtained his Ph. D. (Engineering) degree for research conducted in the field of spatial mechanisms kinematic analysis; in 1992 – obtained his Sc. D.(Engineering) degree for development of parallel structure spatial mechanisms; from 1992 – was employed as Senior Researcher, Leading Researcher, Principal Researcher, Head of Lab., Head of Department, Deputy Director at A. Blagonravov Mechanical Engineering Research Institute of the Russian Academy of

Sciences (IMASH RAN); 2000 – defended his Ph.D. (Philosophy) thesis on Methodology Problems of Mechanisms Theory; 2003 – defended his Sc. D. (Philosophy) thesis dedicated to the robotics engineering methodological problems; 2015 – Director, IMASH RAN.

Main Research Field: robotics, parallel structure spatial mechanisms, machines and mechanisms theory and control.

Main Research Results:

Problems have been solved for synthesis and analysis methodology of multicomponent, manipulation, measuring, technological and test systems based on the parallel structure principles, at the same time the mathematical apparatus of screw calculus has been developed for the study of these objects.

There have been developed the schemes of mechanisms for:

- wind tunnel testing the aerospace systems models,
- ultra-precise vacuum manipulation,
- measuring robotic systems,
- automobile test rigs,
- laser treatment of objects,
- robotic technological installations,
- crystals fragments modeling,
- training systems of robotic surgical operations.

The methodological problems of the engineering sciences development have been investigated on the example of the theory of mechanisms and robots and the particular features of these sciences have been revealed in the context of the science general methodology.

Keynote Speech: DIGITAL TRANSFORMATION OF HIGHER EDUCATION VIA COMPUTING

Speaker: Prof. Matthew He (Nova Southeastern University, Florida, USA)

Time: 9:00-9:30, October 5, 2019

Location: "Amethyst" conference hall of Moscow Salut Hotel

Конференц-зал «Аметист» - Гостиница «Салют»

Abstract. What is the role of computing technology in higher education? How should technology be used for teaching and learning? What types of learners can best benefit from what types of technology? How does technology affect what and how we teach? How does technology affect our lifestyles and our whole educational system? Should we reconstruct education because of technology? What should the educational system look like in the next few years because of these advancements in digital technology? In this talk, we present a history and timeline of educational technology, evolution of technology, expanded interpretation of e-learning, and discuss the better match ("best-fit") between learning technology and eight different types of learner's intelligence, and future of educational technology.

Biography

Matthew He, Ph.D., is Full Professor and Assistant Dean of the Halmos College of Natural Sciences and Oceanography of Nova Southeastern University, Florida, USA. He is Full Professor and Grand Ph.D. from the World Information Distributed University since 2004. He has been awarded as an Academician of European Academy of Informatization since 2004. He received the World Academy of Sciences Achievement Awards in recognition of his research contributions in the field of computing in 2003 and 2010. Dr. Matthew He was selected as one of 65 outstanding overseas Chinese scientists in Chinese Stamp Book Collection in 2014 in worldwide distribution with a limited edition. Dr. Matthew He has authored and edited 10 books and conference proceedings and published over 100 research papers in the areas of mathematics, bioinformatics, computer vision, information theory, math and engineering techniques in medical and biological sciences. He is an invited series editor of Biomedical and Life Sciences of Henry Stewart Talk "Using Bioinformatics in Exploration in Genetic Diversity". He has served as a member of International Advisory Board of "International Symmetry Association (ISA) since 2004. He is also an Editor-in-Chief of International Journal of Information Technology and Computer Science, and an editor of International Journal of Software Science and Computational Intelligence, International Journal of Cognitive Informatics and Natural Intelligence, International Journal of Biological Systems, and International Journal of Integrative Biology. He is a member of American

Mathematical Society (AMS), Association of Computing Machinery (ACM), IEEE Computer Society, World Association of Science Engineering (WASE), and International Advisory Board member of Bioinformatics Group of International Federation for Information Processing (IFIP).

Keynote Speech: DIGITAL ECONOMY, BASIC TECHNOLOGIES OF INDUSTRY 4.0 AND UNDERSTANDING AGENTS

Speaker: V.B. Tarassov, Prof., Dr. Sci. (Bauman Moscow State Technical University, Russia)

Time: 9:30-10:00, October 5, 2019

Location: "Amethyst" conference hall of Moscow Salut Hotel

Конференц-зал «Аметист» - Гостиница «Салют»

Abstract. The objective of the talk consists in considering the challenges of Digital Economy, presenting Industry 4.0 paradigm with reviewing its basic technologies and discussing the arrival of new generation cognitive and collaborative robots viewed as Understanding Agents. Ontological models of understanding, as well as cognitive architecture of understanding agent are introduced.

Biography

Valery B. Tarassov, Prof., Dr. Sci.

Current employments. He is the deputy director of CIM department of Bauman Moscow State Technical University (BMSTU) responsible for research work.

President of Russian Association for Fuzzy Systems and Soft Computing, Member of Scientific Council of Russian Association for Artificial Intelligence, Co-Editor of the Proceedings of the International Conferences on Intelligent Information Technologies for Industry (2016-2019) published in Advances in Intelligent Systems and Computing.

He was the supervisor of 9 PhD. From 1995 to 1997 he was a visiting professor at the University of Valenciennes and Hainaut-Cambresis (France). He is the author or co-author of 8 books (in Russian): "Methods and Languages for Ontological Modeling" (2017); "Soft Computing and Measurement" (2017); "Approaches to the Modeling of Thinking" (2014); "Mathematical Psychology" (2010); "Fuzzy Hybrid Systems" (2007); "From Multi-Agent Systems to Intelligent Organizations" (2002); "Intelligent Tutoring Systems and Virtual Educational Institutions" (2001); "Fuzzy Sets in Control and Artificial Intelligence Models" (1986). His first Russian monograph on multi-agent systems "From Multi-Agent Systems to Intelligent Organizations" has been awarded in 2004 by Russian Association for Artificial Intelligence as the best book in AI and its applications. He is the organizer of the 1st BMSTU plenary session on Industry 4.0 strategies at the International Conference on Intelligent Systems and CIM on January 26, 2019.

Prof. Valery B. Tarassov is the author of more than 270 papers. During last five years he was the invited speaker in English of the following international conferences: the 10th World Conference on Intelligent Systems for Industrial Automation (WCIS-2018, Tashkent, Uzbekistan, October 25-27, 2018), the 3rd International Scientific Conference "Intelligent Information

Technologies for Industry (IITI'18, Sochi, September 17-21, 2018), the 2nd Russian-Pacific Conference on Computer Technology and Applications (RPC 2017, Vladivostok, September 25-29, 2017), the 2nd International Scientific Conference on Intelligent Information Technologies for Industry (IITI 2017, Varna, Bulgaria, September 14-16, 2017), the 9th International Conference on Theory and Application of Soft Computing, Computing with Words and Perceptions (ICSCCW-2017, Budapest, Hungary, August 22-23, 2017), the 2017 Annual Conference on Biologically Inspired Cognitive Architectures (BICA-2017, Moscow, Russia, August 1-6, 2017), the 9th World Conference on Intelligent Systems for Industrial Automation (Tashkent, Uzbekistan, October 25-27, 2016), the 9th IEEE International Conference on Application of Information and Communication Technologies (AICT'2015, Rostov-on-Don, 14-16 October 2015), the 8th International Conference on Soft Computing, Computing with Words and Perceptions in Systems Analysis, Decision and Control (ICSCCW-2015, Antalya, Turkey, September 3-4, 2015).

Part III Instructions for Presentations

Oral Presentation

Devices Provided by the Conference Organizer:

Laptops (with MS-Office & Adobe Reader)

Projectors & Screen

Laser Sticks

Materials Provided by the Presenters:

PowerPoint or PDF files

Durations of each Presentation (Tentatively):

Regular Oral Session: about 15-20 Minutes of Presentation, 5 Minutes of Q&A

Keynote Speech: 25-30 Minutes of Presentation, 10 Minutes of Q&A

Part V Hotel Information

*Conference Hotel - Moscow Salut Hotel 4**

Russia, Moscow, Leninskiy prospect, 158

http://www.hotelsalut.ru

Moscow Salut Hotel 4* is the choice of many tourists, who visit Moscow. It can welcome and accommodate tourist group and individual guests. Hotel is located in the South-West of Moscow in 15 min. from Vnukovo Airport and connected with Sheremetyevo and Domodedovo airports by the Moscow Ring Road. Next to the hotel is situated Troparevo Leisure Park and Yugo-Zapadnaya metro station, where located one of the biggest shopping centre AVENUE is and many other shops. In just 20 min. by metro, you can reach the Red Square and Kremlin Museums. Salut Hotel offers 1090 rooms, equipped with all necessary for comfortable accommodation. There are 8 restaurants and cafes, 7 conference halls, fitness-club with swimming pool and SPA&Beauty salon.

Part VI Contact Us

Contact Information

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