



Aleksandr I. Panov

Curriculum Vitae

Educational Background

- 2011–2015 **Ph.D. in Theoretical Bases of Computer Science**, *Institute for Systems Analysis*, Moscow, Russia.
Specialized in modelling of goal-oriented behavior of intelligent agents and their coalitions
- 2009–2011 **Master of Applied Mathematics and Physics**, *Moscow Institute of Physics and Technology*, Moscow, Russia.
Specialized in logical methods (AQ, JSM) of data mining and multiagent systems
- 2005–2009 **Bachelor of Physics**, *Novosibirsk State University*, Novosibirsk, Russia.
Specialized in semantic integration of databases

Research Experience

- 2015–Present **Research Fellow**, NATIONAL RESEARCH UNIVERSITY HIGHER SCHOOL OF ECONOMICS, Laboratory of Process-Aware Information Systems (PAIS Lab), Moscow, Russia.
- Investigation of learning mechanisms based on sign representations in the problem of collective behavior planning.
- 2010–Present **Senior Research Fellow**, FEDERAL RESEARCH CENTER “COMPUTER SCIENCE AND CONTROL” OF RUSSIAN ACADEMY OF SCIENCES, Laboratory of Dynamic Intelligent Systems, Moscow, Russia.
- Cognitive modelling:
 - Proposed the models of a number of cognitive functions of consciousness based on the so-called “semiotic mediation”.
 - Proposed a model of the sign and investigated procedures of the sign formation.
 - Proposed biologically inspired models of sign components: image, significance and personal meaning.
 - Matching learning and multi-agent systems:
 - Developed the composite logical method to extract cause-effect relationships.
 - Investigated some models of coalition formation and role distribution in the collective of intelligent agents.

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Teaching Experience

- 2015–Present **Associate Professor**, *National Research University Higher School of Economics*, Faculty of Computer Science, Moscow, Russia.
Seminar on Intelligent Data Mining
- 2011–Present **Associate Professor**, *Moscow Institute of Physics and Technology*, Department of Computer Science, Moscow, Russia.
Seminar on Basis of Operation Systems and Basis of Object-Oriented Programming
- 2011–2016 **Assistant Lecturer**, *Peoples' Friendship University of Russia*, Department of Computer Science, Moscow, Russia.
Lectures on Intelligent Dynamic Systems, Theoretical Computer Science and Intelligent Data Analysis

Research Grants

As a head

- 2016–Present **Grant for postdocs**, *Russian Foundation for Basic Research (RFBR)*.
Investigation of learning mechanisms based on sign representations in the problem of collective behavior planning.
- 2016–Present **Oriented basic research**, *Russian Foundation for Basic Research (RFBR)*.
Development of new methods for knowledge base construction, search and adaptation of cases for scientific-technical solutions and technologies using their text descriptions based on semantic networks.
- 2014–2015 **Grant for young scientists**, *Russian Foundation for Basic Research (RFBR)*.
Investigate of mechanisms for the distribution of roles in the collective of intelligent agents to solve the problem to identify cause-and-effect relationships on the set of domain events.

As a senior researcher

- 2016–Present **Grant in priority thematic research areas**, *Russian Science Foundation (RSF)*, research adviser: Prof. Gennady S. Osipov.
Creation of theory, methods and models for distributed control of behavior of cognitive robotic systems and their coalitions in nondeterministic environment.
- 2015–Present **Individual grant**, *Russian Foundation for Basic Research (RFBR)*, research adviser: Prof. Gennady S. Osipov.
Neurophysiological and psychological foundations of sign models of the world and cognitive functions.
- 2015–Present **Grant for young headers**, *Russian Foundation for Basic Research (RFBR)*, research adviser: Ph.D. Konstantin S. Yakovlev.
Path planning methods and algorithms in the context of cooperative task solving for intelligent agents.

Research Interests

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|------------------------------------|--------------------------|
| - Modelling of cognitive processes | - Multi-agent systems |
| - Semiotics | - Modelling of attention |
| - Pattern recognition | - Machine learning |

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Committees and Councils

- 2016–present Member of the Editorial Board of the *Biologically Inspired Cognitive Architectures*: BICA Journal, <http://www.journals.elsevier.com/biologically-inspired-cognitive-architectures/>
- 2016–Present Member of The Biologically Inspired Cognitive Architectures Society: BICA Society, bicasociety.org
- 2016–Present Executive Chair of the Organizing Committee of the First International Early Research Career Enhancement School on Biologically Inspired Cognitive Architectures: Fierces on BICA, school.bicasociety.org
- 2015–Present Regular Fellow of the Russian Association of the Artificial Intelligence: RAAI, www.raai.org
- 2015–Present Member of the NEURONET workgroup of the National Technology Initiative: NTI, www.asi.ru/nti/

Selected Publications

- [1] G. S. Osipov, A. I. Panov, and N. V. Chudova. "Behavior control as a function of consciousness. I. World model and goal setting". In: *Journal of Computer and Systems Sciences International* 53.4 (2014), pp. 517–529.
- [2] A. I. Panov. "Extraction of Cause–Effect Relationships from Psychological Test Data Using Logical Methods". In: *Scientific and Technical Information Processing* 41.5 (2014), pp. 275–282.
- [3] G. S. Osipov, A. I. Panov, and N. V. Chudova. "Behavior Control as a Function of Consciousness. II. Synthesis of a Behavior Plan". In: *Journal of Computer and Systems Sciences International* 54.6 (2015), pp. 882–896.
- [4] A. I. Panov, A. V. Shvets, and G. D. Volkova. "A Technique for Retrieving Cause and Effect Relationships from Optimized Fact Bases". In: *Scientific and Technical Information Processing* 42.6 (2015), pp. 420–425.
- [5] A. A. Boyko, A. M. Kaidina, Y. C. Kim, A. Yu. Lupatov, A. I. Panov, R. E. Suvorov, and A. V. Shvets. "A Framework for Automated Meta-Analysis: Dendritic Cell Therapy Case Study". In: *Proceedings of the 2016 IEEE Eighth International Conference on Intelligent Systems*. Ed. by Ronald Yager, Vassil Sgurev, Mincho Hadjiski, and Vladimir Jotsov. IEEE, 2016, pp. 160–166.
- [6] Stanislav Emel'yanov, Dmitry Makarov, Aleksandr I. Panov, and Konstantin Yakovlev. "Multilayer cognitive architecture for UAV control". In: *Cognitive Systems Research* 39 (2016), pp. 58–72.
- [7] Aleksandr I. Panov and Konstantin Yakovlev. "Behavior and Path Planning for the Coalition of Cognitive Robots in Smart Relocation Tasks". In: *Robot Intelligence Technology and Applications 4*. Ed. by Jong-Hwan Kim, Fakhri Karray, Jun Jo, Peter Sincak, and Hyun Myung. Advances in Intelligent Systems and Computing. Springer International Publishing, 2016, pp. 3–20.
- [8] Aleksandr I. Panov and Konstantin S. Yakovlev. "Psychologically Inspired Planning Method for Smart Relocation Task". In: *Procedia Computer Science* 88 (2016), pp. 115–124.

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- [9] Aleksey Skrynnik, Alexander Petrov, and Aleksandr I. Panov. “Hierarchical Temporal Memory Implementation with Explicit States Extraction”. In: *Biologically Inspired Cognitive Architectures (BICA) for Young Scientists*. Ed. by Alexei V. Samsonovich, Valentin V. Klimov, and Galina V. Rybina. Advances in Intelligent Systems and Computing. Springer International Publishing, 2016, pp. 219–225.