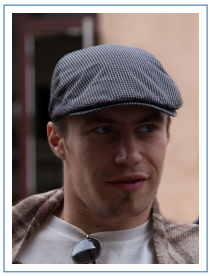

# Aleksandr I. Panov

*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.
  - Proposed algorithms of role distribution in coalition of cognitive agents.
- Maching learning and multi-agent systems:
  - Developed the composite logical method to extract cause-effect relationships.
  - Proposed neuromorphic algorithm of machine learning - heterarchical causal network.
- Robotics:
  - Developed multilayer control system for coalition of cognive robots.

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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

2017–Present **Grant in priority thematic research areas**, *Russian Foundation for Basic Research (RFBR)*, research adviser: Nataliya Chudova.
Network approach for construction of sign based world model and sign realization of cognitive functions.

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

- Modelling of cognitive processes
- Multi-agent systems
- Semiotics
- Behavior planning

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- Robotics - Machine learning

## 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`

2016–Present Mentor of student laboratory of AI, `www.slabai.ru`

2015–Present Regular Fellow of the Russian Association of the Artificial Intelligence: RAAI, `www.raai.org`

## 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] 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.

[3] 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: *2016 IEEE 8th International Conference on Intelligent Systems (IS)*. Ed. by Ronald Yager, Vassil Sgurev, Mincho Hadjiski, and Vladimir Jotsov. IEEE, 2016, pp. 160–166.

[4] 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.

[5] 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.

[6] Aleksandr I. Panov and Konstantin S. Yakovlev. "Psychologically Inspired Planning Method for Smart Relocation Task". In: *Procedia Computer Science* 88 (2016), pp. 115–124.

[7] Gleb A. Kiselev and Aleksandr I. Panov. "Synthesis of the Behavior Plan for Group of Robots with Sign Based World Model". In: *Interactive Collaborative Robotics*. Ed. by A. Ronzhin, G. Rigoll, and R. Meshcheryakov. Lecture Notes in Computer Science. Springer, 2017, pp. 83–94.

[8] Aleksandr I. Panov. "Behavior Planning of Intelligent Agent with Sign World Model". In: *Biologically Inspired Cognitive Architectures* 19 (2017), pp. 21–31.



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