

University	Peter the Great St. Petersburg Polytechnic University
Level of English proficiency	Upper Intermediate
Courses and fields of studies offered for applicants	2.3.4 “Control in organizational systems” (2.3.4.0 “Control in organizational systems”)
Research projects of the prospective academic supervisor	Current Research Grants: – 2024–present: Research project “Study of Approaches to the Development of Intelligent Multi-Agent Systems for Predictive and Prescriptive Analytics in Industry” (Ministry of Science and Higher Education of the Russian Federation, State Assignment No. 075-03-2024-004, project code FSEG-2024-0004, registration number 124062900023-5). – 2025–present: Research project “Application of Multi-Agent Approach to Scheduling in Manufacturing Systems Considering Conflicts Between Agents’ Objective Functions” (Russian Science Foundation, agreement No. 25-21-00322 dated 28.12.2024, registration number 125021702358-4). – 2025–present: Project “Multi-Agent Decision Support Systems in Industry and Construction” (Ministry of Science and Higher Education, agreement No. 075-15-2025-210 dated 04.04.2025 on the allocation of federal grants as part of the Strategic Academic Leadership Program ‘Priority 2030’). – 2025–present: Project “Development of Methodological Foundations and Tools for Hybrid Modeling Combining Machine Learning and Simulation Methods” (Ministry of Science and Higher Education, agreement No. 075-15-2025-210 dated 04.04.2025 on the allocation of federal grants as part of the Strategic Academic Leadership Program ‘Priority 2030’). Current Applied Projects Commissioned by Companies (Company Names Protected by NDA): – 2024–present: R&D project “Development of a Mathematical Model for Dynamic Simulation of Traffic Flows” (transport sector). – 2024–present: R&D project “Development and Integration of a Comprehensive Digital Model of Airline X’s Operations into the Airline’s Infrastructure” (air transport sector). – 2025–present: Research project “Development of Methodology and Algorithms for Merging Ontologies of Digital Twins” (oil and gas sector).
Topics offered for prospective researches	1. Development of methodological foundations for integrating simulation modeling and machine learning in the study of organizational systems. 2. Models and methods of cooperative game theory for managing decentralized organizational systems. 3. Study of principles and development of models of agent self-organization in complex organizational systems. 4. Probabilistic approaches to modeling and optimizing complex organizational systems with multiple hierarchical levels.

	5. Development of methods and algorithms for multi-parameter optimization of complex organizational systems with distributed decision-making centers. 6. Multi-agent decision-support systems in hierarchically organized production complexes. 7. Method and algorithms for automatic calibration of simulation models of complex organizational systems, accounting for data incompleteness and the probabilistic nature of control processes. 8. Models and methods for assessing the resilience of distributed organizational systems using evolutionary game-theory techniques.
 Research supervisor: Aleksei M. Gintciak Candidate of Science in Engineering (Peter the Great St. Petersburg Polytechnic University)	1.02. Computer and information sciences 1.02.ER. Computer science, Cybernetics
	Supervisor's research interests Mathematical and computer models of organizational systems. Distributed organizational systems. Multi-agent systems. Hybrid modeling. Optimization of organizational systems. Game theory in organizational systems.
	Study program highlights – research topics that are in demand from industrial partners and supported by the scientific community (including the dissertation council); – opportunity to develop one's own research direction within the laboratory's global specialization; – potential employment while working on projects of the "Digital Modeling of Industrial Systems" laboratory; – a young, rapidly developing research team that already has significant scientific achievements in both fundamental and applied research; – an engaged scientific supervisor, support from senior colleagues, and opportunities for collaboration with other postgraduate students; – building a scientific track record (publications in high-ranked journals, participation in international conferences, intellectual property, personal grants and scholarships).
	Supervisor's specific requirements – Knowledge of mathematical analysis and applied mathematics. – Skills in mathematical and computer modeling (native or in modeling environments). – Confident understanding of probability theory and mathematical statistics. – Skills in working with scientific information (searching for and analyzing sources). – Level of scientific communication (preparing publications, presenting research results) – not lower than basic.
	Supervisor's publications Over the last 5 years – 54 publications, of which 23 are in Scopus and/or Web of Science databases (8 – in Q1 journals). The most significant: 1. Bolsunovskaya M., Gintciak A., Burlutskaya Z., Zubkova D., Petryaeva A., Fedyaevskaya D. Complex Method of the Consumer Value Estimation on the Way to Risk-Free and Sustainable

	Production // Sustainability. 2023. № 15 (2). P. 1273. DOI: 10.3390/su15021273. (Q1) 2. Pospelov K.N., Burlutskaya Z.V., Gintciak A.M., Troshchenko K.D. Multiparametric optimization of complex system management scenarios based on simulation models // International Journal of Technology. 2023. V. 14 (8). P. 1748-1758. DOI: 10.14716/ijtech.v14i8.6832. (Q1) 3. Pospelov K.N., Vatamaniuk I.V., Lundaeva K.A., Gintciak A.M. Heuristic Approach to Planning Complex Multi-Stage Production Systems // International Journal of Technology. 2023. V. 14 (8). P. 1790-1799. DOI: 10.14716/ijtech.v14i8.6833. (Q1) 4. Lundaeva K.A., Saranin Z.A., Pospelov K.N., Gintciak A.M. Demand Forecasting Model for Airline Flights Based on Historical Passenger Flow Data // Applied Sciences. 2024. № 14 (23). P. 11413. DOI: 10.3390/app142311413. (Q1) 5. Sharko P.A., Burlutskaya Z.V., Zubkova D.A., Gintciak A.M., Pospelov K.N. AI-Supported Decision Making in Multi-Agent Production Systems Using the Example of the Oil and Gas Industry // Applied Sciences. 2025. № 15 (10). P. 5366. DOI: 10.3390/app15105366. (Q1) Impacts of Supervisor's research 39 intellectual property objects: computer programs, databases.
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