

Victoria EROFEEVA

Optimization Researcher | Distributed Intelligence | Multi-Agent Systems | Networked Control

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 Google Scholar

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 Moscow, St. Petersburg, Sirius  Russia

SUMMARY

Optimization and multi-agent systems researcher working on adaptive distributed intelligence, networked control, and efficient model optimization. My research develops mathematical and algorithmic methods for learning, coordination, and decision-making in systems operating under uncertainty, noise, nonstationarity, communication constraints, and limited computational resources.

My recent work includes accelerated stochastic approximation algorithms, zeroth-order and distributed optimization, coalitional control in large-scale networks, decentralized clustering, adaptive task allocation, and consensus-based positioning. I am particularly interested in connecting rigorous optimization and control theory with emerging problems in distributed AI, memory-efficient model adaptation, LLM-agent coordination, and multi-robot autonomy.

My publications include papers in *IEEE Transactions on Automatic Control*, *Automatica*, *Information Sciences*, *Scientific Reports*, *IEEE Access*, and major systems-and-control conferences.

RESEARCH INTERESTS

- › Stochastic, distributed, and zeroth-order optimization
- › Nonstationary learning and optimization under uncertainty
- › Multi-agent systems, consensus, and graph-based coordination
- › Networked control and cyber-physical systems
- › Coalitional and multilevel control of large-scale networks
- › Distributed intelligence and LLM-agent coordination
- › Efficient model optimization and memory-aware LLM adaptation
- › Multi-robot coordination and embodied multi-agent AI
- › Robust algorithms under communication, sensing, and actuation constraints

HIGHLIGHTED PUBLICATIONS

- 2026 Erofeeva, V., Granichin, O., Sergeenko, A. Accelerated Consensus-Based SPSA Algorithm for Multisensor Multitarget Tracking Problem // *IEEE Transactions on Automatic Control*, 2026, Early Access (Q1)
<https://doi.org/10.1109/TAC.2026.3678473>
- 2025 Erofeeva, V., Granichin, O., Uzhva, D. Meso-Scale Coalitional Control in Large-Scale Networks // *Automatica*, Volume 177, July 2025, 112276 (Q1)
<https://doi.org/10.1016/j.automatica.2025.112276>
- 2025 Erofeeva, V., Parsegov, S. A Novel Sparsity-based Deterministic Method for Shapley Value Approximation, with Applications // *Information Sciences*, 2025, 121923 (Q1)
<https://doi.org/10.1016/j.ins.2025.121923>
- 2025 Erofeeva, V., Granichin, O., Tarasova E. Zero-Order Distributed Non-Stationary Optimization for Hölder-Smooth Problems With Unknown-But-Bounded Noise // *IEEE Access*, 13, 209658-209679 (Q1)
<https://doi.org/10.1109/ACCESS.2025.3642469>
- 2025 Tarasova E., Erofeeva, V., Granichin, O., Chernikov K. Decentralized adaptive task allocation for dynamic multi-agent systems // *Scientific Reports*, 15 (1), 39226 (Q1)
<https://doi.org/10.1038/s41598-025-21709-9>
- 2025 Chernov, A., Erofeeva, V., Granichin, O., Sudomir, A. Accelerated SPSA-based Consensus Algorithm for Mutual Device Positioning // 2025 IEEE 64th Conference on Decision and Control (CDC), 8071–8076
<https://doi.org/10.1109/CDC57313.2025.11312296>

ADDITIONAL SELECTED PUBLICATIONS

44 peer-reviewed publications; 1 manuscript under review. Current h-index : 7 (Google Scholar), 6 (Scopus).

Journal Papers :

- 2026 Amelin, K., Erofeeva, V., Granichin, O., Len, I. Randomized Estimation for Low-Light Imaging With Unknown-but-Bounded Noise // IEEE Access, 14, 49518–49534 (Q1)
<https://doi.org/10.1109/ACCESS.2026.3678054>
- 2025 Erofeeva, V., Granichin, O., Pankov V., Volkovich Z. Communication-efficient decentralized clustering for dynamical multi-agent systems // PLoS One, 20 (7), e0327396 (Q1)
<https://doi.org/10.1371/journal.pone.0327396>
- 2024 Erofeeva, V., Granichin, O., Volodina, E. Accelerated Decentralized Load Balancing in Multi-Agent Networks // IEEE Access, 2024. (Q1)
<https://doi.org/10.1109/ACCESS.2024.3488399>
- 2024 Erofeeva, V., Granichin, O., Avros, R., and Volkovich, Z. Multilevel modeling and control of dynamic systems // Scientific Reports, 14(1), 27903 (Q1)
<https://doi.org/10.1038/s41598-024-79279-1>
- 2024 Pugach, M., Bogdanov, S., Vlasov, V., Erofeeva, V., Parsegov, S. Identification of crossover flux in VRFB cells during battery cycling // Journal of Power Sources, 2024, 610, 234745 (Q1)
<https://doi.org/10.1016/j.jpowsour.2024.234745>
- 2021 Granichin, O., Erofeeva, V., Ivanskiy, Y., Jiang, Y. Simultaneous Perturbation Stochastic Approximation-based Consensus for Tracking under Unknown-but-Bounded Disturbances // IEEE Transactions on Automatic Control, Volume 66, Issue 8, 2021 (in press) (Q1, SJR 3.908, WoS 5.625).
<https://doi.org/10.1109/TAC.2020.3024169>

Conference Papers :

- 2025 Chernov, A., Erofeeva, V., Granichin, O., Moseiko, E., Sudomir, A. SPSA-based Consensus Algorithm for Mutual IoT Device Positioning // IFAC-PapersOnLine, 59 (14), 133–138
- 2025 Erofeeva, V., Pankov, V., Smetanina, V. Decentralized Clustering for Adaptive Control in Dynamic Multi-Agent Systems // IFAC-PapersOnLine, 59 (14), 139–144
- 2023 Borisoglebskaya, E., Erofeeva, V., Granichin, O., Ivanskiy, Y., Kizhaeva, N. Distributed Load Balancing Based on Modified Local Voting Protocol // 2023 9th International Conference on Control, Decision and Information Technologies (CoDIT), 2032–2036
- 2023 Erofeeva, V., Granichin, O. Improved Simultaneous Perturbation Stochastic Approximation-based Consensus Algorithm for Tracking // 2023 31st Mediterranean Conference on Control and Automation (MED), 850–855
<https://doi.org/10.1109/MED59994.2023.10185823>
- 2023 Erofeeva, V., Parsegov, S., Osinenko, P., Kamal, S. Distributed State Estimation for Multi-Area Data Reconciliation // 2023 31st Mediterranean Conference on Control and Automation (MED), 954–959
<https://doi.org/10.1109/MED59994.2023.10185911>
- 2023 Erofeeva, V., Ershov, V., Granichin, O., Pankov, V., Uzhva, D., Granichina, O. Adaptive Distributed Cluster Flow Control for a Group of Autonomous Robots // IFAC-PapersOnLine, 56 (2), 8690–8695
- 2022 Erofeeva, V., Sergeenko, A., Granichin, O. Accelerated Online Distributed Optimization for Parameter Estimation Under Uncertainties // 2022 6th Scientific School “Dynamics of Complex Networks and their Applications”, 244–247
<https://doi.org/10.1109/DCNA56428.2022.9923289>
- 2022 Erofeeva, V., Granichin, O., Tursunova, M., Sergeenko, A., Jiang, Y. Accelerated Simultaneous Perturbation Stochastic Approximation for Tracking under Unknown-But-Bounded Disturbances // 2022 American Control Conference (ACC), 1582–1587
<https://doi.org/10.23919/ACC53348.2022.9867491>
- 2021 Erofeeva, V., Granichin, O., Granichina, O., Proskurnikov, A., Sergeenko, A. Weighted SPSA-based Consensus Algorithm for Distributed Cooperative Target Tracking // 2021 European Control Conference (ECC), 1074–1079

Principal Investigator / Research Lead

- Safe and Communication-Efficient Zeroth-Order Optimization for Control and Learning in Networked Systems** 2026–2027
Russian Science Foundation | Principal Investigator
PI ZO Optimization Networked Control
- Development of Optimization Methods for Networked Systems Incorporating Uncertainties and Constraints** 2022–2024
Russian Science Foundation | Principal Investigator
PI Distributed Optimization Uncertainty
- Development of Accelerated Optimization Algorithms for Networked Systems** 2022–2023
Ministry of Science and Higher Education | Principal Investigator
PI Accelerated Optimization Networked Systems
- Coordinated Network Control of a Self-Organizing Group of Unmanned Aerial Vehicles** 2017–2019
Foundation for Assistance to Small Innovative Enterprises | Principal Investigator
PI UAV Coordination Multi-Agent Control

Selected Collaborative and Industrial Projects

- Multi-Agent Adaptive Control in Networked Dynamical Systems with Application to Robotic Devices under Uncertainty** 2021–2023
Russian Science Foundation | Researcher
Multi-Agent Control Robotics Uncertainty
- Stochastic Programming for Bundle Adjustment** 2021–2022
Huawei Technologies Co. Ltd. | Researcher
Stochastic Programming Estimation Imaging
- Research on Applicability of Local Voting Protocol in Fronthaul Wireless Networks** 2020–2021
Huawei Technologies Co. Ltd. | Researcher
Local Voting Communication Networks Distributed Algorithms
- Randomized Multi-Agent Optimization, Pattern Recognition and Estimation Algorithms under Significant Uncertainties** 2020–2022
Russian Foundation for Basic Research | Researcher
Randomized Optimization Estimation Uncertainty
- Model Predictive Adaptive Control with Time-Varying State-Space Structure and Applications in Networked Control of Motion and Automatic Medical Tools** 2016–2020
[Project website](#)
Russian Science Foundation | Researcher
Adaptive MPC Networked Control Medical Systems

SELECTED PROFESSIONAL EXPERIENCE

Present June 2024	Lead Specialist, AI CENTER, SAINT PETERSBURG STATE UNIVERSITY, St. Petersburg, Russia ➤ Conduct research on distributed optimization, multi-agent systems, and AI methods for large-scale networked environments. ➤ Develop mathematically grounded algorithms for adaptive learning, coordination, and cyber-physical systems. Distributed Optimization Multi-Agent Systems Networked AI
June 2024 May 2019	Senior Researcher, INSTITUTE OF PROBLEMS OF MECHANICAL ENGINEERING, RUSSIAN ACADEMY OF SCIENCES, St. Petersburg, Russia ➤ Conduct research on stochastic approximation, distributed optimization, estimation, and networked control. ➤ Develop multi-agent coordination algorithms under uncertainty, nonstationarity, and communication constraints. Stochastic Approximation Networked Control Multi-Agent Coordination
December 2020 August 2019	Lead Engineer, HUAWEI TECHNOLOGIES, MOSCOW RESEARCH CENTER, Moscow, Russia ➤ Conducted industrial research on computational imaging, color correction, and related algorithmic problems. ➤ Contributed to optimization-based methods for image processing and large-scale estimation. Computational Imaging Optimization Industrial Research
December 2018 March 2016	Junior Researcher, INSTITUTE OF PROBLEMS OF MECHANICAL ENGINEERING, RUSSIAN ACADEMY OF SCIENCES, St. Petersburg, Russia ➤ Conducted research on stochastic programming, distributed optimization, estimation, and multi-agent systems. ➤ Developed optimization and control methods for networked systems under uncertainty. Stochastic Programming Distributed Optimization Multi-Agent Systems

EDUCATION

June 2019 September 2015	PhD in Mathematical Cybernetics, SAINT PETERSBURG STATE UNIVERSITY, St. Petersburg, Russia Thesis : Multi-Agent Based Observer Control in Sensor Networks
June 2015 September 2013	M.Sc. in Computer Science, SAINT PETERSBURG STATE UNIVERSITY, St. Petersburg, Russia Thesis : Adaptive Load Balancing of Web Server System Using Simultaneous Perturbation Stochastic Approximation
June 2013 September 2008	Specialist Degree in Computer Science, TAMBOV STATE TECHNICAL UNIVERSITY, Tambov, Russia Thesis : Development of CAD System for Biological Cleaning of Oily Wastes

PATENTS AND SOFTWARE CERTIFICATES

2024	Software Module for Load Balancing in Networked Systems Registration No. RU 2024685603
2023	Software Module for Gradient-Free Optimization Based on Accelerated Stochastic Approximation Registration No. RU 2023685135
2019	Optimization Software for Task Assignment in Sensor Networks and Parameter Estimation under Hardware and Communication Constraints Registration No. RU 2019617033

TEACHING, SUPERVISION & MENTORSHIP

Current	PhD Supervision Supervising one PhD student on meso-scale control of robot teams, including networked coordination algorithms and experimental validation on a robotic testbed.
Previous	Student and PhD Mentorship in Research Projects Mentored graduate and PhD students within research projects on stochastic approximation, distributed optimization, multi-agent systems, and networked control. Mentorship experience is supported by joint publications with A. Sergeenko, M. Tursunova, A. Leonova, and E. Borisoglebskaya / E. Volodina.
2016–2020	Teaching in Multi-Agent Technologies Instructor / co-instructor at St. Petersburg State University. Topics included graph theory, consensus algorithms, distributed optimization, multi-agent coordination, and networked systems.
Fall 2017	Co-instructor, <i>Parallel Programming</i> , St. Petersburg State University Topics included parallel algorithms, computational methods, and distributed implementation.

AWARDS & HONORS

2019	IEEE Control Systems Society Travel Grant, 58th IEEE Conference on Decision and Control
2019	Saint Petersburg State University Travel Grant for Presentation of Scientific Paper
2018	Saint Petersburg State University Travel Grant for Presentation of Scientific Paper
2018	St. Petersburg Government Award, grant competition for students and early-career researchers Project : <i>Multi-Agent Based Observer Control in Sensor Networks</i> ; Diploma PSP No. 18380
2017	St. Petersburg Government Award, grant competition for students and early-career researchers Project : <i>Development of an Adaptive Decentralized Route Planning Algorithm for a Group of Unmanned Aerial Vehicles Performing Monitoring Tasks</i> ; Diploma PSP No. 17545

INTERNATIONAL EXPERIENCE

Collaborative Research on Ultrasound Computed Tomography and Sparse 3D Reconstruction

2018–2019

National Key Research and Development Program of China | Researcher | Wuhan, China

Contributed to optimization and reconstruction methods for ultrasound computed tomography, including compressive sensing formulations, sparse-data reconstruction, wavelet-based 3D reconstruction analysis, and time-of-flight algorithms for direct and reflected signals.

International Research Compressive Sensing 3D Reconstruction Medical Imaging

PROFESSIONAL MEMBERSHIPS & SERVICE

2019–Present	Memberships : IEEE Member; IEEE Control Systems Society; IEEE CSS Women in Control
2021–Present	Reviewer : IEEE Transactions on Automatic Control; Scientific Reports; IEEE and IFAC conferences
2018	Program Committee Member : 3rd Conference on Software Engineering and Information Management

TECHNICAL SKILLS

Mathematical Methods	Stochastic optimization, zeroth-order optimization, distributed optimization, graph theory, consensus algorithms, networked control, multi-agent systems
Programming & Scientific Computing	Python, MATLAB, NumPy, SciPy, Pandas, Matplotlib, Plotly, Seaborn
Machine Learning	Scikit-learn, PyTorch, Hugging Face Transformers, PEFT / LoRA
Optimization & Simulation Tools	CVXPY, Gurobi, numerical simulation, algorithm prototyping
Software Engineering & Deployment	Git, Docker, FastAPI, AWS, ETL
Databases	MySQL, PostgreSQL

REFERENCES

Available upon request.