

Alexey Podobryaev

Date of birth: 06.07.1978. Citizenship: Russia. Languages: Russian, English.

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Research interests

Geometric control theory, sub-Riemannian geometry, natural language processing, machine learning.

Education

- 2020 PhD Steklov Mathematical Institute of RAS, Moscow,
thesis: *Symmetries and optimal synthesis in left-invariant optimal control problems*,
adviser: prof. Yu.L. Sachkov,
referees: prof. A. G. Kushner, prof. L. A. Manita, prof. V. N. Berestovskii.
- 2001 MSc Lomonosov Moscow State University, diploma with honor,
thesis: *Invariant algebras of functions
on spherical homogeneous spaces of simple Lie groups*,
adviser: prof. È. B. Vinberg, referee: prof. I. V. Arzhantsev.

Professional experience

- since 2009 A.K. Ailamazyan Program Systems Institute of RAS, Pereslavl-Zalesskiy, Russia,
junior researcher, senior researcher.
- 2001–2009 Parascript L.L.C., Advanced R&D,
researcher and software engineer in pattern recognition, machine learning.
- 2000–2001 Moscow Center of Continuous Mathematical Education,
Laboratory for Pattern Recognition, researcher.

Teaching experience

- 2009–2017 University of Pereslavl, Russia,
Lecturer, algebra, linear algebra and geometry, theory of recursive functions.
- 1997–2002 Moscow School #1543, math teacher,
geometry, special course of mathematics for gifted students.

Reviewer

Journal of Dynamical and Control Systems, Program Systems: Theory and Applications,
Mathematical Notes, Instruments and Experimental Techniques,
Proceedings of Steklov Mathematical Institute, MathSciNet

Grants

RFBR 19-07-00991 A, 19-07-00779 A, 15-07-05277 A, 13-07-00307 A, 12-07-31101 mol_a.
RSF 17-11-01387, 17-11-01387-P, 22-21-00877, 22-11-00140.

Programming skills

Wolfram Mathematica, C++, Python.

Sport activities

Whitewater kayaking, whitewater kayak/canoe slalom, crosscountry skiing,
winner of several local races,
Word Masters Games, Ivrea 2013, K1m-35 3d place,
European Masters Games, Ivrea 2019, K1m-40 2d place,
ICF World Masters Championship, Krakow 2021, 3 × C1m team race 3d place,
local coach in Pereslavl kayak club,

Publications

GEOMETRIC CONTROL THEORY

- [1] A. V. Podobryaev. *Homogeneous geodesics in sub-Riemannian geometry* // ESAIM: Control, Optimisation and Calculus of Variations. 29, 11 (2023) [download](#) [arXiv:2202.09085](#)
- [2] A. Podobryaev. *Attainable set for rank 3 step 2 free Carnot group with positive controls* // 16th International Conference on Stability and Oscillations of Nonlinear Control Systems (Pyatnitskiy's Conference). 1–4, DOI: 10.1109/STAB54858.2022.9807600, IEEE (2022) [arXiv:2203.02267](#)
- [3] A. Mashtakov, A. Podobryaev. *Geodesic flow of the sub-Riemannian structure of Engel type with strictly abnormal extremals* // 16th International Conference on Stability and Oscillations of Nonlinear Control Systems (Pyatnitskiy's Conference), 1–3, DOI: 10.1109/STAB54858.2022.9807528, IEEE (2022)
- [4] A. V. Podobryaev. *Construction of Maxwell points in left-invariant optimal control problems* // Proceedings of the Steklov Institute of Mathematics. 315, 190–197 (2021)
- [5] A. V. Podobryaev. *Casimir functions of free nilpotent Lie groups of steps three and four* // Journal of Dynamical and Control Systems. 27, 625–644 (2021) [arXiv:2006.00224](#)
- [6] A. V. Podobryaev. *Coadjoint orbits of three-step free nilpotent Lie groups and time-optimal control problem* // Doklady Mathematics. 102, 1, 293–295 (2020)
- [7] A. V. Podobryaev. *Symmetries in left-invariant optimal control problems* // Sbornik: Mathematics. 211, 2, 275–290 (2020) [arxiv:1807.09145](#)
- [8] A. V. Podobryaev. *Symmetric extremal trajectories in left-invariant optimal control problems* // Russian Journal of Nonlinear Dynamics. 15, 4, 569–575 (2019) [download](#)
- [9] A. V. Podobryaev. *Antipodal points and diameter of a sphere* // Russian Journal of Nonlinear Dynamics. 14, 4, 579–581 (2018) [download](#)
- [10] A. V. Podobryaev. *Diameter of the Berger Sphere* // Mathematical Notes. 103, 5, 846–851 (2018) [arXiv:1710.02945](#)
- [11] A. V. Podobryaev, Yu. L. Sachkov. *Symmetric Riemannian Problem on the Group of Proper Isometries of Hyperbolic Plane* // Journal of Dynamical and Control Systems. 24, 3, 391–423 (2018) [arXiv:1701.00825](#)
- [12] A. V. Podobryaev, Yu. L. Sachkov. *Left-Invariant Riemannian Problems on the Groups of Proper Motions of Hyperbolic Plane and Sphere* // Doklady Mathematics. 95, 2, 176–177 (2017)
- [13] A. V. Podobryaev, Yu. L. Sachkov. *Cut locus of a left invariant Riemannian metric on $SO(3)$ in the axisymmetric case* // Journal of Geometry and Physics. 110, 436–453 (2016) [arXiv:1504.05472](#)

- [14] A.N. Vinogradov, N. Vlasova, E.P. Kurshev, A. Podobryaev. *Modern Approaches to the Language Data Analysis. Using Language Analysis Methods for Management and Planning Tasks* // Cyber-Physical Systems and Control. D.G. Arseniev, L. Overmeyer, H. Kalviainen, B. Katalinic eds. Lecture Notes in Networks and Systems. Springer. 95, 470–481 (2020)
- [15] A.N. Vinogradov, N. Vlasova, E.P. Kurshev, A. Podobryaev. *Information extraction tasks in public administration domain ISIDA-T natural language processing system* // ACM International Conference Proceeding Series. 1CSIS'2019: Proceedings of the XI International Scientific Conference Communicative Strategies of the Information Society. 15, 1–10 (2019)
- [16] I. Trofimov, E. Suleymanova, N. Vlasova, A. Podobryaev. *Disambiguation between eventive and non-eventive meaning of nouns* // Program Systems: Theory and Applications. 9, 4(39), 3–33 (2018) (in Russian). [download](#)
- [17] N. Vlasova, A. Podobryaev. *Automatic noun phrases extraction using preliminary segmentation and CRF with semantic features* // Program Systems: Theory and Applications. 8, 4(35), 21–30 (2017) (in Russian). [download](#)
- [18] N. Vlasova, A. Podobryaev. *To the noun phrase recognition problem in application to automatic information extraction from Russian texts* // Program Systems: Theory and Applications. 7, 1(28), 153–170 (2016) (in Russian). [download](#)
- [19] N. Vlasova, A. Podobryaev. *Complex time expressions recognition problem in application to automatic information extraction from Russian texts* // Program Systems: Theory and Applications. 7, 4(31), 177–195 (2016) (in Russian). [download](#)
- [20] A.N. Vinogradov, N. A. Vlasova, E. P. Kurshev, A. V. Podobryayev, E. A. Suleymanova. *Specifics of ontology editor's user interface* // Program Systems: Theory and Applications. 4, 4(18), 33–44 (2013) (in Russian). [download](#)