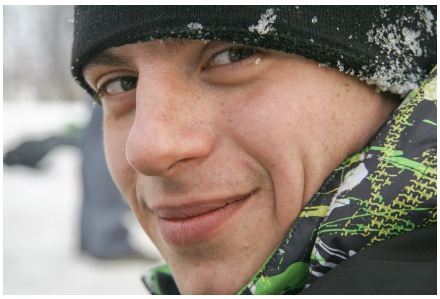
Curriculum Vitae of Alexey P. Mashtakov

January 15, 2014



Personal Data

Born: May 29, 1987, in Serpukhov, USSR.

Citizenship: Russia.

Address: 52/7, Komsomolskiy lane, 140170, Bronnicy, Russia.

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Education: Ph.D. in Applied Mathematics and Computer Science, PSI RAS, 2013 (Supervisor: Yu.L. Sachkov)
M.S. in Applied Mathematics and Computer Science, University of Pereslavl, 2009 (Supervisor: Yu.L. Sachkov).

Foreign Languages: English.

Positions: Junior researcher, Control Process Research Center of Program Systems Institute, Russian Academy of Sciences, since 2012.
Research engineer, Program Systems Institute, Russian Academy of Sciences, 2010–2012.
Engineer, Program Systems Institute, Russian Academy of Sciences, 2006–2010.

Research Interests: Sub-Riemannian Geometry, Invariant Control Systems on Lie Groups, Optimal Control, Nonlinear Geometric Control Theory, Motion Planning, Applications to Robotics, Mechanics, and Reconstruction of Images, Computer Science.

Languages/Programming: Wolfram Mathematica, C/C++, Visual Basic, Haskell

Grants

Research grants from the Russian Foundation for Basic Research, Russian Government (since 2006).
SADCO (FP7-PEOPLE-ITN-2010, Grant Agreement No. 264735), 2012.

Reviewer

Automation and Remote Control, since 2012.

Awards/Achievements

Diploma in the category "Outstanding report", *The third traditional youth summer school "Control, Information and Optimization"*, Yaropolec, Russia, 2011.
Certificate for the best report, *International student, postgraduate and young scientist conference "Lomonosov-2011"*, Moscow, Russia, 2011.

Teaching Experience

Lecturer: Algebra, University of Pereslavl, 2012.
Teaching assistant: Practical training session on computer (work in Wolfram Mathematica), University of Pereslavl, 2011.
Teaching assistant: Practical training session on computer (a supplement to the course of PDE's), University of Pereslavl, 2011.
Teaching assistant: Ordinary differential equations, University of Pereslavl, 2010.

Publications

Papers in Reviewed Journals

1. (with Yu. Sachkov, A. Ardentov, V. Kasimov) Reconstruction of images via variational principle (in Russian), *Programmnye produkty i sistemy*, 2009, No. 4, 126–127.

2. (with Yu. Sachkov, A. Ardentov) Parallel algorithm and software for recovery of isophotes for corrupted images (in Russian), *Programmnye Sistemy: Teoriya i Prilozheniya*, 1(1), 2010, 3–20.

3. (with Yu. Sachkov) Extremal trajectories and the asymptotics of the Maxwell time in the problem of the optimal rolling of a sphere on a plane, *Sbornik Mathematics*, 2011, 202:9, 1–25.

4. Parallel software package for nonholonomic control problems (in Russian), *Programmnye produkty i sistemy*, 2012, No. 1, p 146-151.

5. Algorithms and Software Solving a Motion Planning Problem for Nonholonomic Five-dimensional Control Systems (in Russian), *Programmnye Sistemy: Teoriya i Prilozheniya*, 1(10), 2012, 3–29.

6. (with A. Ardentov, I. Beschastny, Y. Sachkov) Interface for study of sub-Riemannian geodesics on 3d Lie groups (in Russian), *Programmnye produkty i sistemy*, 4, 2012, p. 200-203.

7. (with A. Ardentov, I. Beschastny, Y. Sachkov, A. Popov, E. Sachkova) Algorithms for evaluation position and orientation of UAV (in Russian), *Programmnye Sistemy: Teoriya i Prilozheniya*, 3(12), 2012, p. 23-29.

8. (with Yu. Sachkov, A. Ardentov) Parallel Algorithm and Software for Image Inpainting via Sub-Riemannian Minimizers on the Group of Rototranslations, *Numerical Mathematics: Theory, Methods and Applications (NM-TMA)*, 6, 2013, 61–95.

9. (with A. Popov) Asymptotics of Maxwell time in the plate-ball problem, *Journal of Mathematical Sciences*, Vol. 195, 3, 2013, 336–368.

Proceedings of Conferences and Workshops

1. Riemannian geodesic lines on surfaces of revolution, (in Russian), In: *Proceedings of scientific conference "Program systems: Theory and applications"* , Pereslavl-Zalessky, 2006, v.2, pp. 39–52.

2. Extremal curves in the problem of a sphere rolling on a plane, (in Russian), *Proceedings of XI students conference of Pereslavl University*, Pereslavl-Zalessky, 2007, pp. 23–30.

3. Nilpotent approximations based solution of control problem for nonlinear five-dimensional systems, (in Russian), *Proceedings of XIII Annual Scientific-Practical Conference of Pereslavl University*, Pereslavl-Zalessky, 2009, pp. 117–131.

4. (with Yu. L. Sachkov, A. A. Ardentov) Constructive solution to control problem via nilpotent approximation method (in Russian), *Proceedings of Program Systems institute scientific conference "Program systems: Theory and applications"*, Pereslavl-Zalesskij, v.1, 2009, pp. 5–23.

5. Asymptotic of Extremal trajectories in the plate-ball problem (in Russian)// *Proceedings of the International Conference on Mathematical Control Theory and Mechanics (Suzdal, July 3-7, 2009), CMFD, 42, PFUR*, 2011, 158–165.

Participation in Conferences and Workshops

1. Riemannian geodesic lines on surfaces of revolution, *Scientific conference "Program systems: Theory and applications"* , Pereslavl-Zalessky, Russia, 2006.

2. Extremal curves in the problem of a sphere rolling on a plane *Proceedings of XI students conference of Pereslavl University*, Pereslavl-Zalessky, Russia, 2007.

3. Orientation control of the sphere rolling on the plane, (in Russian), *Proceedings of XII students conference of Pereslavl University*, Pereslavl-Zalessky, Russia, 2008.

4. Nilpotent approximations based solution of control problem for nonlinear five-dimensional systems, *Proceedings of XIII Annual Scientific-Practical Conference of Pereslavl University*, Pereslavl-Zalessky, Russia, 2009.

5. Approximate solution of motion planning problem for nonlinear five-dimensional systems, *International Conference on Mathematical Control Theory and Mechanics*, Suzdal, Russia, 2009.

6. Motion planning problem for nonlinear five-dimensional systems using nilpotent approximation *Symposium with international participation "Control Theory: New Methods and Applications"*, Pereslavl-Zalessky, Russia, 2009.

7. Asymptotics of exponential mapping and limit behavior of Maxwell points in the plate-ball problem, *Workshop on Nonlinear Control and Singularities*, Porquerolles (83400 HYERES LES PALMIERS, France), 2010.

8. Asymptotics of Maxwell time in the plate-ball problem, *International student, postgraduate and young scientist conference "Lomonosov-2011"*, Moscow, 2011.

9. Cut time for rolling of a sphere along sinusoids of small amplitude, *The third traditional youth summer school "Control, Information and Optimization"*, Yaropolec, Russia, 2011.

10. Optimal Inpaiting parallel software for image inpainting via sub-Riemannian minimizers on the group of rototranslations (in Russian), *International Conference on Mathematical Control Theory and Mechanics*, Suzdal, Russia, 2011.

11. Asymptotics of Maxwell time in the problem on optimal rolling of a sphere on a plane. *International Conference on Control and Optimization of Nonholonomic Systems*, Pereslavl-Zalessky, Russia, 2011.

12. Motion planning problem for nonlinear control systems in robotics, *The International Conference on Differential Equations and Dynamical Systems*, Suzdal, Russia, 2012.

13. Optimal control of a mobile robot on a plane, *Control in engineering, ergatic, organizational and network systems*, Saint Petersburg, Russia, 2012.

14. Motion planning problem for some control systems applied in robotics, *SADCO Summer School and Workshop "New Trends in Optimal Control"*, Ravello, Italy, 2012.

15. Optimal control problem for left-invariant sub-Riemannian structures on the special linear group *The International Conference on Mathematical Control Theory and Mechanics*, Suzdal, Russia, 2013.

16. Integrability of the left-invariant sub-Riemannian structures on the special linear group, *Control and optimization of nonholonomic systems*, Pereslavl-Zalessky, Russia, 2013.

17. Integrability of invariant sub-Riemannian structures on 3D Lie groups, *Differential Geometry and its Applications*, Brno, Czech Republic, 2013.