

# Curriculum Vitae of Yuri L. Sachkov

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## Personal Data

**Born:** November 23, 1964, in Dnepropetrovsk, USSR.

**Citizenship:** Russia.

**Address:** Program Systems Institute, Russian Academy of Science, Pereslavl-Zalessky 152020, Russia.

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**Education:** Doctor of Science (habilitation), Steklov Mathematical Institute, 2008,  
Post-doctoral fellow, SISSA (Scuola Internazionale di Studi Avanzati), Trieste, Italy, 1999–2001, (supervisor Prof. A. A. Agrachev),  
Doctorant, Steklov Mathematical Institute, 1998–1999, (consultant Prof. A. A. Agrachev),  
Ph.D. in Mathematics, Moscow State University, 1992 (supervisor Prof. A. F. Filippov),  
M.S. in Mathematics, Moscow State University, 1986.

**Foreign Languages:** English.

**Positions:** Chief of laboratory, Program Systems Institute (PSI), Russian Academy of Sciences, since 2009.

Full Professor, Department of Mathematics, University of Pereslavl, since 2009.

Senior researcher, Program Systems Institute (PSI), Russian Academy of Sciences, 1995–2009.

Associate Professor, Department of Mathematics, University of Pereslavl, 1994–2009.

Researcher, PSI, 1993 – 1994.

Teacher, Department of Mathematics, University of Pereslavl, 1993 – 1994.

Junior researcher, PSI, 1989 – 1993.

**Research Interests:** Sub-Riemannian Geometry, Right-Invariant Control Systems on Lie Groups, Optimal Control, Bilinear Systems, Nonlinear Geometric Control Theory.

## Teaching Experience

Supervisor of PhD theses, since 2009.

Various Courses on Geometric Control Theory in Trieste, Rouen, Pereslavl, since 1997.

Teacher of Calculus in University of Pereslavl, since 1993.

Adviser of bachelor and master theses, since 1996.

## Research Visits

Universities of Lille, Dijon, Augsburg, Coimbra, Aveiro, Trieste, Rouen, Milano (since 1995).

## Professional Activities

Managing Editor of *Journal of Dynamical and Control Systems*, Springer, since 2007.

Member of the Editorial Board of *Journal of Dynamical and Control Systems*, Kluwer Academic / Plenum Publishers, New York, London, and Dordrecht, since 1996.

## Grants

Research grants from the Russian Foundation for Basic Research, INTAS, Russian Government (since 1995).

## Reviewer

*Journal of Dynamical and Control Systems*, Springer, since 1996.

*Mathematical Reviews*, American Mathematical Society, since 1999.

*International Journal of Control*, since 2000.

Russian Journal *Referativnij Zhurnal*, 1995–1996.

## Russian-English Translator

*Journal of Mathematical Sciences*, Springer, since 2000.

*Moscow University Mathematics Bulletin*, Allerton Press, 1995–1999.

## Publications

### Books

1. (with A.A. Agrachev) Control Theory from the Geometric Viewpoint, Springer-Verlag, 2004; *Russian version: Geometric Control Theory*, Moscow, Fizmatlit, 2005.
2. Controllability and symmetries of invariant systems on Lie groups and homogeneous spaces (in Russian), Moscow, Fizmatlit, 2007.

### Papers in Reviewed Journals

1. Controllability of 3-dimensional Bilinear Systems, *Vestnik Moskovskogo Universiteta, Ser. Math. Mech.*, (1991), 3: 26–30 (in Russian, translated into English in *Moscow University Mathematics Bulletin*).
2. Invariant Domains of 3-dimensional Bilinear Systems, *Vestnik Moskovskogo Universiteta, Ser. Math. Mech.*, (1991), 4: 23–26 (in Russian, translated into English in *Moscow University Mathematics Bulletin*).
3. Positive Orthant Controllability of 2-dimensional and 3-dimensional Bilinear Systems, *Differentsialnija Uravnenija*, (1993), 2: 361–363 (in Russian, translated into English in *Differential Equations*).
4. Positive Orthant Controllability of Single-input Bilinear Systems, *Mat. zametki*, **85** (1995), 3: 419–424 (in Russian, translated into English in *Mathematical Notes*).
5. Invariant Orthants of Bilinear Systems, *Differentsialnija uravnenija*, **31** (1995), 6: 1094–1095 (in Russian, translated into English in *Differential equations*).
6. Controllability of Hypersurface and Solvable Invariant Systems, *Journal of Dynamical and Control Systems*, **2** (1996), 1: 55–67.
7. Controllability of Affine Right-Invariant Systems on Solvable Lie Groups, *Discrete Mathematics and Theoretical Computer Science*, **1** (1997), 239–246.
8. On Positive Orthant Controllability of Bilinear Systems in Small Codimensions, *SIAM Journ. Control and Optimization*, **35** (1997), 1: 29–35.
9. Controllability of Right-Invariant Systems on Solvable Lie Groups, *Journal of Dynamical and Control Systems*, **3** (1997), 4: 531–564.
10. On Invariant Orthants of Bilinear Systems, *Journal of Dynamical and Control Systems*, **4** (1998), 1: 137–147.
11. Classification of controllable systems on low-dimensional solvable Lie groups, *Journal of Dynamical and Control Systems*, **6** (2000), 2: 159–217.
12. Exponential mapping in the generalized Dido problem (in Russian), *Matem. Sbornik*, **194** (2003), 9: 63–90.
13. Symmetries of Flat Rank Two Distributions and Sub-Riemannian Structures, *Transactions of the American Mathematical Society*, **356** (2004), 2: 457–494.

14. Discrete symmetries in generalized Dido's problem, *Sbornik: Mathematics*, 197 (2006), 2: 235–257.
15. The Maxwell set in the generalized Dido problem, *Sbornik: Mathematics*, 197 (2006), 4: 595–621.
16. Complete description of the Maxwell strata in the generalized Dido problem, *Sbornik: Mathematics*, 197 (2006), 6: 901–950.
17. Optimality of Euler's elasticae (in Russian), *Doklady Mathematics*, Vol. 76 (2007), No. 3, 817–819.
18. Maxwell strata in Euler's elastic problem, *Journal of Dynamical and Control Systems*, Vol. 14 (2008), No. 2 (April), 169–234.
19. Conjugate points in Euler's elastic problem, *Journal of Dynamical and Control Systems*, 2008 Vol. 14 (2008), No. 3 (July), 409–439.
20. (with A. Ardentov) Solution of Euler's elastic problem (in Russian), *Avtomatika i Telemekhanika*, 2009, No. 4. (English translation appears in *Automation and remote control*.)
21. (with I. Moiseev) Maxwell strata in sub-Riemannian problem on the group of motions of a plane, *ESAIM: COCV* (accepted).
22. Conjugate and cut time in the sub-Riemannian problem on the group of motions of a plane, *ESAIM: COCV* (accepted)
23. Cut locus and optimal synthesis in the sub-Riemannian problem on the group of motions of a plane, *ESAIM: COCV* (accepted).
24. Symmetries and Maxwell strata in the ball-plate problem, *Sbornik Mathematics* (accepted).

### Survey and Tutorial Works

1. Survey on Controllability of Invariant Systems on Solvable Lie Groups, in: *Differential Geometry and Control*, Proceedings of the AMS Summer Research Institute on Differential Geometry and Control, Boulder, USA, July 1997, Proceedings of Symposia in Pure Mathematics, **64** (1999), 297–317.
2. Controllability of Invariant Systems on Lie Groups and Homogeneous Spaces, in: *Progress in Science and Technology, Series on Contemporary Mathematics and Applications, Thematical Surveys*, Vol. 59, *Dynamical Systems-8*, All-Russian Institute for Scientific and Technical Information (VINITI), Ross. Akad. Nauk, Moscow, 1998 (to appear); English transl: *J. Math. Sci.*, v. 100, No. 4, 2000, 2355–2427.
3. Control Theory on Lie Groups, *Journal of Mathematical Sciences*, Vol. 156, No. 3, 2009, 381–439.