Biographical sketch of Lyudmila Sakhanenko[1]

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Citizenship: Russia
USA status: PR
Born: December 14, 1977
Marital Status: Married
Email: luda@stt.msu.edu

Education

May 2002 PhD, Department of Mathematics and Statistics, University of New Mexico, Albuquerque, NM
- GPA: 4.0/4.0: diploma with distinction
- Major: Statistics
- Concentration: Probability Theory and Statistics
- Dissertation: "Asymptotic theory of symmetry tests for a multivariate distribution"
- Advisor: Vladimir Koltchinskii, PhD

June 1998 BS, Department of Mechanics and Mathematics, Novosibirsk State University, Novosibirsk, Russia
- GPA: 5.0/5.0, diploma with honors; top 0.5% of 250 students
- Major: Mathematics
- Concentration: Probability Theory and Mathematical Statistics

Positions Held

2002-present	Assistant Professor, Department of Statistics and Probability, MSU
1998-2002	Teaching Assistant, Department of Mathematics and Statistics, UNM

Technical Skills

General skills in mathematics, statistics and computing. Specific expertise and interests in:

- Mathematics: analysis; wavelets; probability theory; stochastic, empirical, U-, Gaussian processes.
- Statistics: bootstrap; testing; density estimates; U-statistics; learning theory.
- Programming languages: Matlab, S-plus and C.
- Statistical softwares: extensive experience with S-plus and Minitab, moderate experience with Excel.
- Text formatting and office computing: LaTex, Word and Excel.
- Foreign languages: Russian (native speaker).

Research Interests:

Theory of empirical processes with applications to non-parametric statistics, such as

- bootstrap tests (with financial applications);
- density estimation (with possible biological applications);
- integral curve estimation (with DT-MRI applications);
- statistical learning theory.

[1] Updated August 19, 2009

Honors and Awards

2008-11	National Science Foundation Grant
2004-5	Intramural Research Grant of the MSU Award
2002	Research, Project, and Travel Grant of the UNM Award
2001	Research, Project, and Travel Grant of the UNM Award
2000	Outstanding Teaching Assistant Award
1999	Boeing Computer Services Grant 3-48181
1998	Award for best presentation on the 36th International Scientific Student Conference at Novosibirsk

Submitted for Publication in Refereed Journal

1. Sakhanenko, L.. (2009) Global rate optimality in a model for Diffusion Tensor Imaging. Accepted by *Theory of Probability and Applications*, 17 pages.

2. Koltchinskii, V., Sakhanenko, L.. (2009) Asymptotics of Statistical Estimators of Integral Curves. To appear in *High Dimensional Probability V.* Peligrad (Eds), 12 pages.

3. Sakhanenko, L.. (2009) Lower bounds for accuracy of estimation in Diffusion Tensor Imaging. To appear in *Theory of Probability and Applications*, 54, 15 pages. [2008 Impact factor 0.28?]

Publications in Refereed Journals

4. Sakhanenko, L.. (2008) Testing for Ellipsoidal Symmetry: A comparison study. *Computational Statistics & Data Analysis*, 53, 565-581. [Impact factor 1.029]

5. Koltchinskii, V., Sakhanenko, L., Cai, S.. (2007) Integral Curves of Noisy Vector Fields and Statistical Problems in Diffusion Tensor Imaging: Nonparametric Kernel Estimation and Hypotheses Testing. *Annals of Statistics*, Vol. 35, No. 4, 1576-1607. [Impact factor 1.944, cited by 4]

6. Koul, H., Sakhanenko, L.. (2005) Goodness-of-fit testing in regression: A finite sample comparison of bootstrap methodology and Khmaladze transformation. *Statistics & Probability Letters* 74, 290-302. [Impact factor 0.3, cited by 2]

7. Giné, E., Koltchinskii, V., Sakhanenko L.. (2004) Kernel Density Estimators: Convergence in distribution for weighted sup-norms. *Probability Theory and Related Fields*, vol. 130, No. 2, 167-198. [Impact factor 1.164, cited by 2]

8. Giné, E., Koltchinskii, V., Sakhanenko, L.. (2003) Convergence in distribution of Self-Normalized Sup-Norms of Kernel Density Estimators. *High Dimensional Probability III.* Hoffmann-Jorgensen, Marcus and Wellner (Eds), Birkhauser, Boston, pp. 241-253. [Cited by 2]

9. Borisov, I., Sakhanenko, L.. (2001) The central limit theorem for generalized von Mises statistics with degenerate kernels. (Russian) *Mat. Tr.* 4, no. 1, 3-17.

10. Koltchinskii, V., Sakhanenko, L.. (2000) Testing for ellipsoidal symmetry of a multivariate distribution. *High Dimensional Probability II.* E. Giné, D. Mason and J. Wellner (Eds) Progress in probability, Birkhäuser, Boston, pp. 493-510. [Cited by 3]

11. Borisov I., Sakhanenko L.. (2000) The Central Limit Theorem for generalized canonical von Mises statistics. *Siberian Advances in Mathematics* vol. 10, No. 4, 1-14. [Cited by 1]

Papers in progress.

12. Sakhanenko, L. (2009) Multidimensional Kernel Density Estimators: Convergence in distribution for weighted sup-norms.

13. Sakhanenko, L. (2009) Local estimation model for integral curves in Diffusion Tensor Imaging.

14. Sakhanenko, L. (2009) Testing for group symmetry of a multivariate distribution.

Presentations on seminars and conferences

15. Integral Curve Estimation: Methodology and Applications to Diffusion Tensor Imaging. Universite du Maine, LeMans, France, Asymptotical Statistics of Stochastic Processes VII workshop, March 2009.

16. Integral Curve Estimation: Methodology and Applications to Diffusion Tensor Imaging. Michigan State University, Statistics and Probability colloquium. November 2008.

17-19. Estimation of integral curves in Diffusion Tensor Imaging. Bucknell University, Texas Pan-american University, Marshall University. Colloquium. February-March 2006.

20. Integral Curves of Noisy Vector Fields and Statistical Problems in Diffusion Tensor Imaging: Nonparametric Kernel Estimation and Hypotheses Testing. Michigan State University, Statistics and Probability colloquium. September 2005.

21. Integral Curves of Noisy Vector Fields and Statistical Problems in Diffusion Tensor Imaging. 4th International Conference on High Dimensional Probability, St. John's College, New Mexico, June 2005.

22. Weighted sup-norms for density estimates. Hawaii International conference on Statistics. June 2004.

23. Convergence in distribution of weighted sup-norms of kernel density estimators. Michigan State University, Statistics and Probability colloquium. September 2003.

24. Michigan State University, Graduate Students Research Orientation. Density estimates. September 2003.

25. Bootstrap tests for ellipsoidal symmetry of a multidimensional distribution with applications to finance theory. Hawaii International Conference on Statistics, Honolulu, June 2003.

26. Testing for symmetry. Department of Statistics and Probability Colloquium, MSU, February 2002.

27. Testing for ellipsoidal symmetry (with applications to finance theory). Mathematics and Statistics Department Non-parametric Statistics Seminar Series, UNM, February 2001.

28. Testing for ellipsoidal symmetry of a multivariate distribution. 5th World Congress of the Bernoulli Society for Mathematical Statistics and Probability and 63rd Annual Meeting of the IMS, Guanajuato, Mexico, May 2000.

29. Testing for ellipsoidal symmetry of a multivariate distribution. 2nd International Conference on High Dimensional Probability, University of Washington, August 1999.

30. The limit theorems for von Mises statistics with asymmetrical kernels. The 36th International Scientific Student Conference, Novosibirsk, Russia, April 1998.

Special notes

I was also invited to give a talk on the following two conferences, but had to cancel to avoid travelling while 6 month pregnant:

International conference on Mathematics and Statistics, June 11-12, 2007, Athens, Greece.

International conference Skorokhod space: 50 years on, 17-23 June, 2007, Kyiv, Ukraine.

Active participation in seminars

Fall 2006	Advanced Machine Learning	Dr. Jin (CSE)
Fall 2005	Gaussian processes and their statistical applications	Dr. Xiao (Stat)
Spring 2004	Extreme value theory, Gaussian processes, Long range dependence I co-organized the seminar and I gave 7 talks	Dr. Xiao (Stat)
Fall 2003	Stochastic Processes seminar I gave 3 talks	Dr. Skorokhod (Stat)
Fall 2002-Spr 2003	Seminar on Applied Probability I gave 8 talks	Dr. Mandrekar (Stat) and Dr. Xiao (Stat)
Fall 2002	Stochastic Processes seminar I gave 3 talks	Dr. Skorokhod (Stat)

Grant Activity

- 2008-11, Integral Curve Estimation: New Methodology and Applications to Tensor Diffusion Imaging, NSF, sole PI, funded $104,871
- 2006, Integral Curve Estimation, AWM, sole PI, not funded
- 2004-05, Density estimation in weighted norms with applications to ecology, MSU IGPR, sole PI, funded $9,500
- 2004, Random Measures on Locally Compact Spaces, NSF, co-PI, PI is Dr. Skorokhod (Statistics, MSU), not funded
- 2003, Random Measures on Locally Compact Spaces, NSF, co-PI, PI is Dr. Skorokhod (Statistics, MSU), not funded

Advising

Since Fall 2003 I have been unofficially advising master students. Officially I have advised several master students and I was Master students advisor during Spring 2008. I was advising 1 dual degree - master student during Fall 2007 - Spring 2008. During Fall 2008 I led Sunday study group that helped to prepare for Actuarial Exam P.

I was/am a member of PhD committees of students:

- Tianli Li (Education) Regression methods applied to testing.
- Shaolei Quan (Electrical Engineering)
- Zhe Li (Civil Engineering) Statistical learning theory (neural networks) applied to databases on damage conditions of bridges (graduated Dec. 2008).
- Jerry Scripps (Computer Science & Engineering) Statistical learning theory (neural networks) applied to modelling of social networks (graduated June 2009).
- Rong Liu (Statistics) Semiparametric and nonparametric modelling of financial time series (graduated July 2009).
- Shujie Ma (Statistics)

- Guanqun Cao (Statistics)
- Shuzhuan Zheng (Statistics)

Teaching Activity

At MSU I have taught lower level undergraduate courses (STT 200, STT 231, MTH 132) and upper level undergraduate courses (STT 351, STT 442). I also have taught graduate courses at master level (STT 861, STT 862) and doctoral level (STT 997). See the summary below.

Semester	Course	Title	Enrol.	Instr. Eval.	Course Eval.
Spring-09	STT200	Statistical Methods	120	2.433	2.43(0.68)
	STT351	Probability and Statistics for Engineering	40	2.182	2.70(0.8)
Fall-08	STT200	Statistical Methods	120	2.787	2.43(0.68)
Spring-08	STT351	Probability and Statistics for Engineering	40	2.032	2.70(0.8)
	STT442	Theory of Probability and Statistics II	20	1.7	2.14(0.78)
Spring-07	STT862	Theory of Probability and Statistics II	23	1.5	1.66(0.25)
	STT442	Theory of Probability and Statistics II	25	2.014	2.08(0.22)
Fall-06	STT861	Theory of Probability and Statistics I	27	1.936	1.93(0.34)
Summer-06	STT997	Advanced Topics in Statistics	5	1.49	1.35(0.43)
Spring-06	STT862	Theory of Probability and Statistics II	19	1.328	1.66(0.25)
Fall-05	STT861	Theory of Probability and Statistics I	16	1.592	1.93(0.34)
	STT231	Statistics for Scientists	68	2.578	2.53(0.33)
Spring-05	STT231	Statistics for Scientists	142	2.55	2.53(0.33)
Fall-04	STT231	Statistics for Scientists	142	2.338	2.53(0.33)
Summer-04	STT351	Probability and Statistics for Engineering	18	1.914	2.47(0.40)
Spring-04	STT862	Theory of Probability and Statistics II	17	1.734	1.66(0.25)
	STT351	Probability and Statistics for Engineering	41	2.368	2.47(0.40)
Fall-03	STT861	Theory of Probability and Statistics I	24	2.398	1.93(0.34)
Spring-03	STT351	Probability and Statistics for Engineering	39	2.028	2.47(0.40)
	MTH132	Calculus I	26	1.58	2.07
Fall-02	STT351	Probability and Statistics for Engineering	38	2.018	2.47(0.40)

1=superior, 5=inferior

Instructor evaluation scores are the averages of all SIRS scores including student interest in the course.

Course Evaluation cumulative scores are the averages of department's SIRS scores. The standard deviations are in brackets.

Teaching Activity Courses Taught at UNM

Semester	Course	Title	Enrol.	Instr. Eval
Spring-02	S245	Intro to Business Statistics	50-60	4.6
Fall/Spring-01				
Summer-01	S145	Intro to Statistics	20-30	4.94
Fall/Spring-00				
Fall-99				
Summer-00	M162-3	Calculus I/II	30-40	5.63
Summer/Spring-99				
Fall-98				

1=very poor, 6=excellent

Committee Work / Service to Michigan State University

2008-09	Statistics Faculty Advisory Committee
	College of Natural Sciences Faculty Advisory Committee
	Master's Exams Committee at STT (Chair)
	PhD committees of seven students
	Computer Committee at STT
	Served on 2009 NSF Statistics Panel A
2007-08	Statistics Faculty Advisory Committee
	College of Natural Sciences Faculty Advisory Committee
	Master's Exams Committee at STT (Chair)
	Computer Committee at STT
	Assistant Professor Search in Quantitative Literacy at STT
	Master Students Advisor at STT
	PhD committees of five students
2006-07	Statistics Faculty Advisory Committee (Chair)
	College of Natural Sciences Faculty Advisory Committee
	Dean's Student Advisory Council (Faculty Representative)
	Master's Exams Committee at STT
	PhD committees of three students
2005-06	Statistics Faculty Advisory Committee
	CNS Faculty Advisory Committee
	Master's Exams Committee at STT
	PhD committees of two students
2004-05	Statistics Faculty Advisory Committee
	Probability seminar on Gaussian processes co-organizer
	Master's Exams Committee at STT
	PhD committee of a student
2003-04	Statistics Faculty Advisory Committee (Secretary)
	Major Curriculum Committee
	Master's Exams Committee at STT
	Session Chair on 2003 Hawaii International Conference on Statistics and Related Fields
2002-03	Statistics Faculty Advisory Committee

Referee work for

- International Journal of Biomedical Imaging,
- Journal of Multivariate Analysis,
- Journal of Statistical Planning and Inference,
- Annals of Statistics,
- Bernoulli,
- Statistics and Probability Letters,
- Communications in Statistics Theory and Methods,
- Journal of the American Statistical Association.

Member of editorial board of

- the IMS Lecture Notes and Monograph series, • the IMS collection series.

References (available upon request):

- Jon Wellner (University of Washington) jaw@stat.washington.edu
- Ildar Ibragimov (Petersburg Department of Steklov Institute of Mathematics) ibr32@pdmi.ras.ru
- Alexandre Tsybakov (Universite Paris VI) alexandre.tsybakov@upmc.fr
- Sam Efromovich (University of Texas at Dallas) efrom@utdallas.edu
- Joel Zinn (Texas A&M University) jzinn@math.tamu.edu
- Evarist Gine (University of Connecticut) gine@math.uconn.edu
- * Vladimir Koltchinskii (Georgia Tech) vlad@math.gatech.edu

*= PhD advisor