Curriculum Vita- July , 2011

Shlomo Levental

Office
Department of Statistics&Probability
Michigan State University
East Lansing, MI 48824
E mail: Levental @stt.msu.edu
Phone : 5173558726

Home
636 Tarleton Avenue
East Lansing, MI 48823
Phone: 5173339965

Biographical Data
Born: September 24, 1954
Permanent resident USA
Family Status: Married with 2 children.

Education

Ph.D. University of Wisconsin at Madison
Department of Mathematics.
Area of thesis: Probability Theory.
Thesis advisor: Professor James Kuelbs.
1983-1986

M.Sc. Hebrew university, Jerusalem Israel.
Department of Mathematics
1979-1982.

B.Sc. Hebrew university, Jerusalem Israel.
Department of Mathematics
1973-1976.

Employment

1983-1986: Teaching Assistant at the Deprtment of Mathematics, University of Wisconsin at Madison.
1986-1990: Assistant Professor at the Department of Statistics&Probability Michigan State University.
1990-2000 : Associate Professor at the Department of Statistics&Probability Michigan State University.
2000- Current: Professor at the Department of Statistics&Probability Michigan State University.

Reasearch interest

My general interest is Probability Theory and Stochastic analysis. In the past I was interested in applications of Probability in Banach Space to Statistics which is the area of Empirical Processes. My current main research interest is in the area of Mathematical Finance or Stochastic models in Finance. This area can be considered as part of Applied Probability and is now a hot topic. In another area of research I did recently some work on permutations, signs and maximal inequalities for exchangeable random variables.

Invited conferences and Colloquium presentations

1. 1992 NSF conference at Yale University. Presented: Uniform limit theorems for martingales.

2. 1993 IMA conference at University of Minnesota on Mathematical Finance. Attended.

3. 1994 IMS-Bernoulii society. Invited to give a talk on uniform limit theorems of dependent random variables. (couldn't attend).

4. 1994 Norbert Wiener Conference at MSU on Mathematical Finance. Presented: The problem of arbitrage in Math-Finance.

5. 1996 SIAM annual conference on Mathematical Finance in Kansas City. Presented: How to hedge options in the presence of transaction costs.

6. 1997 AMS at Wayne State University on Mathematical Finance. Presented: How to hedge options in the presence of transaction costs.

7. 1997 Joint Colloquium MSU-UM. Presented: hedging options in the presence of transaction costs.

8. 1998 Department of Statistics&Probability MSU. Presented: On permutations and signs.

9. 2000 Invited speaker to the Third World Congress of Nonlinear Analysis in Catania, Italy. Will present: How to hedge an American option with insufficient initial funds".

10. Invited speaker to Department of Mathematics in Ohio State University (Columbus, 2000)

11. Invited speaker to Bachilier World congress in Mathematical Finance, (June 2001, Crete, Greece)

12. Wayne state University, Department of Mathematics, November 2004.

13. MSU , Department of Statistics&Probability, September 2004.

14. Institute of Research of Georgia, Tibilisi Georgia (August 2006)

15. Colloquium of the Department of Statistics&Probability , MSU (Fall 2006)

16. Functional Itô Formula (Coloquium talk in the department, Fall 2010)

17. The Continuous-Time Principal-Agent Problem with Moral Hazard and Recursive Preferences (presented in the Bachilier World congress in Mathematical Finance, June 2010, Toronto.)

Seminar Organization and Participation

1. Mathematical Finance Seminar. Co-founder and regular speaker 1996-2000.

2. Applied probability Seminar (Organized by Yimin Xiao)

3. Skorokhod Seminar on Probability Theory. 1994-1996.

4. Weekly Departamental Colloquium. Regular attendence.

Major advisor to Ph.D. Students

1. Jongsig Bae was awarded Ph.D. in August 1993 on convergence of stochastic processes. Thesis title: *Covergence of stochastic processes indexed by parameters.*

2. James A. Demopolos was awarded Ph.D. in August 1999 on the topic of Mathematical Finance. Thesis title: *Continuous time arbitrage approached as a problem in constrained hedging.*

3. Chanho Park was awarded Ph.D. in December 1999 on the topic of Mathematical Finance. Thesis title: *Super-replication of European exotic options.*

4. Santosh Mahapatra - Dept. of supply management- Business school. (was awarded PhD in 2006)

5. Lenning Kang 2009- present . Topic: Math Finance.

6. Sumit Sinha 2009- present . Topic: Math Finance.

Advising Students

Since 1986 I have been a member of numerous Ph.D. committees both inside the department and outside of the department mainly in colleges of Engineering and Education. I also regularly advise Master students inside the department.

Curriculum development

I initiated the reorganization of Statistics 886 and Statistics 888.

1. **Statistics 886**. The material covered in this course was expanded. Based on my ideas this course will include Queuing Theory because of the large number of computer science students who are enrolled in the course and the potential for even larger number in the future.
2. **Statistics 888.** This course was renamed: Stochastic Models in Finance. There is a great demand among students both inside and outside the department (Business school) for a course of this type. This will be an ideal course to teach in our department because of the advanced stochastic techniques that is being used in some areas of modern Finance. This area is definitely an emerging area that has a great future potential.
   Remark. For a while it was a mandatory course for Ph.D. students in Finance.

Referee work

1. Associate editor of Statistics and Probability Letters (SPL) (2008)
2. I refereed papers for many journals. Here are some of them: Theoretical Probability, Scandinavian journal of Statistics, Stochastic Processes and their Applications, Letters in Probability&Statistics and American Mathematical Society.

Major Committees

1. Faculty Advisory Committee of the College of Natural Science (1997-1999).
2. Major Curriculum Committee of the department several years.(Chairman in 1996-1997).
3. Subcommittee in the department for hiring of new faculty several times.
4. Graduate Support Committee of the department at various times.
5. Member of the Salary Committee of the department twice.
6. Chair of the Colloquium Committee of the department for 4 years.
7. Member of the Advisory Committee in the department regularly(President for a year).

8. Chairman or member of the Prelim Committee in Probability in the department for 20 years.

Teaching Courses

1. Ph.D. courses. Statistics 881, 882, 961, 962, 964.

2. Service courses. Statistics 200, 351, 421, 441, 442.

3. Master Courses. Statistics 886, 887, 888.

4. Department of Mathematics. Math 124, 132, 133, 235, 415.

List of Publications - Shlomo Levental

1. Uniform Limit Theorems. Ph.D Thesis, University of Wisconsin-Madison,

2. Uniform Limit Theorems for Harris Recurrent Markov Chains. *Theory of Probability and Related Topics*, Vol 80, 101-118, 1988.

3. Proof of Liggett's Version of the Subadditive Erogodic Theorem. *Proceedings of American Mathematical Society*, Vol 102, 169-173, 1988.

4. A Uniform CLT for Uniformly Bounded Families of Martingale Differences. *Journal of Theoretical Probability*, Vol 2, 171-287, 1989.

5. On Pricing of Market-Indexed Certificates of Deposit. *Statistics & Probability* Letters, Vol 8, 329-334, 1989 (joint with J. Gardiner).

6. Weak Convergence in Explosive Autoregression. *The Annals of Statistics*, Vol 17, 1784-1794, 1989 (joint with Hira Koul).

7.Uniform CLT for Markov Chains with Discrete State Space. *Stochastics Processes and their Applications*, Vol 34, 245-253, 1990.

8. Uniform CLT for Markov Chains and its Invariance Principle: A Martingale Approach. *Journal of Theoretical Probability,* Vol 8, 549-570, 1995 (joint with J. Bae).

9. A Uniform CLT for Continuous Martingales. *Journal of the Korean Statistical Society*, Vol 24, 225-231, 1995 (joint with J. Bae).

10. Necessary and Sufficient Conditions for Absence of Arbitrage with Tame Portfolios. *Annals of Applied Probability*, Vol 5, 906-925, 1995 (joint with A.V. Skorokhod).

11. On the Possibility of Hedging options in the Presence of Transactions Costs. *Annals of Applied Probability*, Vol. 7, 410-443, 1997 (Joint with A.V. Skorokhod).

12. Permutations, Signs and the Brownian Bridge. *Statistics& Probability Letters***,** Vol. 46, Issue 3, 270-276, **2000.**

13. A maximal inequality for real numbers with application to exchangeable random variables. *Theory of Probability and its Applications*, v 45, issue 3, pp 615-621, **2000**.

14. On coupling of Brownian Bridges.
Theory of Probability and its Applications, v 46, issue 1, pp 169-175, **2001**.

15. The super-replication problem via probabilistic methods. *Annals of Applied Probability*, **2003**, Vol 13, No 2, 742-773**.** (joint with M. Ryznar and P. Jakubanes).

16. Some problems in the theory of super-replication: Market viability and multidimensional options. Technical report 594 , July 2000. (joint with M. Ryznar).

17. On a.s. convergence of the quadratic variation of Brownian Motion. *Stochastics Processes and their Applications*, Vol 106, Issue 2, August 2003, Pages 317-333. (joint with R. V. Erickson).

18 Prokhorov blocks and strong law of large numbers under rearrangements (joint with S. Chobanyan and V. Mandrekar). *Journal of Theoretical Probability*, Vol 17, Issue 3, Pages 647-672, 2004.

19. General Maximal Inequalities related to strong law of large numbers (Joint with S. Chobanyan and H. Salehi). *Math Notes* (*Zamekti*). Volume 81, 1, pages 98-111, 2007.

20. On the constant in Menshov-Rademacher inequality **(**Joint with S. Chobanyan and H. Salehi**).** *Journal of Inequalities and Applications*. Volume: 2006, Article ID 68969, pages 1-7, 2006.

21. A note on absorbing probabilities in one-dimensional random walk via complex-valued martingales (joint with D. Gilliland and Y. Xiao) *Statistics and Probability letter* Volume 77, pages 1098-1105, 2007.

22. Strong law of Large numbers under general moment conditions**(**Joint with S. Chobanyan and H. Salehi**)** *Electronic Communications in Probability*. Published on October 3, 2005, Volume 10 (2005), paper 22.

23. Optimal Sourcing under price uncertainty: A risk averse buyer's perspective (Joint with Santosh Mahapatra and Ram Narasimahan).
DSI conference Proceedings, San Francisco, November 2005.

24. The behavior of available end to end bandwidth: A non-parametric approach (Joint with A. Chobanyan, M. Mutka and N. Xi). *The International Conference on Quantitative Evaluation of Systems (QEST 2006),* University of California, Riverside, 2006.

27. Optimal Sourcing Strategy For A Risk Averse Buying Firm With Proportional Switching Cost (Joint with Santosh Mahapatra and Ram Narasimahan). *INFORMS conference,* November, 2006.

28. Equivalence of convergence for almost all signs and almost all rearrangements of functional series(joint with S. Chobanyan, V. Mandrekar) *Bulletin of Georgian National Academy of Sciences,* v.3, No. 2, 2009.

29. Towards Nikishin theorem on the rearrangement a.s. convergence of functional series(joint with S. Chobanyan, V. Mandrekar), 15 pages. *Functional Analysis and Its Applications*, *Vol*. 45, *No*. 1, 2011 (Translated from *Funktsional nyi Analiz i Ego Prilozheniya*, *Vol*. 45, *No*. 1, *pp*. 41–55, 2011)

30. "Integrated Contract and Market Procurement By A Risk Averse Buying Firm". (Joint with Santosh Mahapatra , Ram Narasimahan and Bisi Arnab). Submitted to *Production and Operations Management* (March 7, 2011)

31. Price Uncertainty and Risk-Averse Procurement: Integrating Contract and Open Market Alternatives (Joint with Santosh Mahapatra and Ram Narasimahan). *Submitted to the Transactions on Engineering Management*. (February 1, 2011)

32. The Continuous-Time Principal-Agent Problem with Moral Hazard and Recursive Preferences(joint with Mark Schroder, Sumit Sinha), 38 pages. Submitted to *Stochastic Processes and their Applications***.** (April 2011). **(**This paper was presented in the Bachilier World congress in Mathematical Finance, June 2010, Toronto.)

34. Functional Itô Formula(joint with Mark Schroder, Sumit Sinha), 19 pages. Submitted to *Operations Research* (June 9, 2011). This paper was presented in a colloquium talk in the department)

35. A MAXIMUM INEQUALITY FOR REARRANGEMENTS OF SUMMANDS AND ASSIGNMENTS OF SIGNS (Joint with S.Chobanyan, H. Salehi) (Submitted to *Theory of Probability and its applications*, July 2011)

36. Almost Surely Convergent Summands of a Random Sum . (Joint with S.Chobanyan, V.Mandrekar) (will be submitted in the next few days to *Letters in Statistics and Probability*)

37. Optimal Contracting and Nash Equilibria in the Continuous-Time Principal-Agent Problem with Multiple Principals. (joint with Mark Schroder, Lening Kang). The paper is essentially ready. To be submitted soon.

38. A Maximum Principle for Multidimensional BSDEs. (joint with Mark Schroder, Sumit Sinha). The paper is essentially ready. To be submitted soon.

Unpublished Manuscripts

1. Hedging the American option with insufficient initial funds. (Joint with A.V. Skorokhod, 2001).

2. Continuous time arbitrage and constrained hedging. (joint with J. A. Demopolos, 2000).

3. A new probabilistic proof for Von Neumann's mean ergodic theorem via an exact formula for the second moment of the sample mean. (2007)

4. Prediction of an Extremal Behavior of an Available Bandwidth (Joint with A. Chobanyan, M. Mutka and N. Xi). (2008)

5. Non-Parametric Modeling of Available End-to-end Bandwidth With Prediction and Self-verification (Joint with A. Chobanyan, M. Mutka and N. Xi). (2008)