

Michael Ludkovski

Department of Statistics & Applied Probability
University of California
Santa Barbara, CA 93106-3110

Phone: (805) 893-5634
Email: ludkovski@pstat.ucsb.edu
<http://www.pstat.ucsb.edu/faculty/ludkovski>

Professional Experience

Assistant Professor, University of California, Santa Barbara, CA July 2008–present
Department of Statistics and Applied Probability
Term Assistant Professor, University of Michigan, Ann Arbor, MI Sept 2005–May 2008
Department of Mathematics

Education

Princeton University, Princeton, NJ 2005
Ph.D., Operations Research and Financial Engineering
Simon Fraser University, Burnaby, BC, Canada 2001
B.Sc., Honors Mathematics
Budapest Semesters in Mathematics, Hungary Fall 1999

Research Interests

- Stochastic control, optimal stopping, stochastic filtering, Markov processes, Monte Carlo methods in finance.
- Energy markets, real options, optimal insurance design, mortality risk, American options, applied probability.

Grants and Awards

- “Third Western Conference in Mathematical Finance”, NSF Grant, co-PI 2009
with J-P Fouque
- “Relative Hedging of Systematic Mortality Risk”, with E. Bayraktar. CKER 2007
Grant, Society of Actuaries; PI
- “Financial Engineering for Actuarial Mathematics Workshop” NSF Grant; 2007
PI.
- Francis S. Upton Fellowship, Princeton University 2007
- Governor General’s Silver Medal for top undergraduate GPA 2001-2005
- Gordon M. Shrum Academic Scholarship, Simon Fraser 2001
University

Publications

17. Optimal Execution in Illiquid Financial Markets, with E. Bayraktar, *Mathematical Finance*, to Appear, 2009
16. A Simulation Approach to Optimal Stopping under Partial Information, *Stochastic Processes and Applications*, to Appear, 2009.
15. Ex Post Moral Hazard and Bayesian Learning in Insurance, with V.R. Young, *Journal of Risk and Insurance*, to Appear, 2009.
14. Optimal Risk Sharing with Distorted Probabilities, with V.R. Young, *Mathematics and Financial Economics*, 2(2), pp. 87–105, 2009.
13. Inventory Management with Partially Observed Nonstationary Demand, with E.

- Bayraktar, *Annals of Operations Research*, to Appear, 2009.
12. Optimal Tracking of a Hidden Markov Chain with Point Process Observations, with E. Bayraktar, *Stochastic Processes and Applications*, 119(6), pp. 1792—1822, 2009.
 11. Relative Hedging of Systematic Mortality Risk, with E. Bayraktar, *North American Actuarial Journal*, 13(1), pp. 106—140, 2009.
 10. Valuation of Energy Storage: An Optimal Switching Approach, with R. Carmona, *Quantitative Finance*, to Appear, 2009.
 9. Swing Options, with R. Carmona, *Encyclopedia of Quantitative Finance*, R. Cont Ed., Wiley, to Appear, 2009.
 8. Financial Hedging of Operational Flexibility, *International Journal of Theoretical and Applied Finance*, 11(8), pp. 799—839, 2008
 7. On Comonotonicity of Pareto Optimal Allocations, with L. Rüschendorf, *Statistics and Probability Letters*, 78(10), pp.1181—1188, 2008.
 6. Indifference Pricing of Annuities under Stochastic Mortality and Stochastic Interest Rates, with V.R. Young, *Insurance: Mathematics and Economics*, 42(1), pp. 14—30, 2008.
 5. Filling the Gap between American and Russian Options: Reduced Regret, with S. Dayanik, *Stochastics*, 79(1-2), pp. 61—83, 2007.
 4. Pricing Asset Scheduling Flexibility using Optimal Switching, with R. Carmona. *Applied Mathematical Finance*, 15(6), pp. 405—447, 2008.
 3. Energy Trading, with R. Carmona, *SIAM News*, 39(5), June 2006.
 2. Spot Convenience Yield Models for the Energy Markets, with R. Carmona. *Mathematics of Finance*, 2004, *AMS Comm. volume 351*, Eds. G Yin and Q Zhang, pp. 65—80.
 1. New Families of Ideal 2-Level Autocorrelation Ternary Sequences from Second Order Decimation Hadamard Transform, with G. Gong. *International Workshop in Coding and Cryptography*, Elsevier, 2001, pp. 345—354.

Working Papers

- Finite Horizon Decision Timing with Partially Observable Poisson Processes, with S. Sezer, 2008.
- Pricing Commodity Derivatives with Partial Observations and Basis Risk, with R. Carmona, 2006.

Presentations and Seminars

2009

- “A Simulation Approach to Optimal Stopping under Partial Information”, Southern California Probability Symposium, Dec 2009.
- “Optimal Execution in Illiquid Markets”, Financial Mathematics Seminar, UT Austin, TX. Sep 2009.
- “Optimal Execution in Illiquid Markets”, Invited Speaker, INFORMS Applied Probability Conference, Ithaca, NY. July 2009.
- “A Simulation Approach to Optimal Stopping under Partial Information”, Optimal Stopping with Applications Symposium, Turku, Finland. June 2009.
- “Optimal Switching Games for Emissions Trading”, Invited Speaker, MSRI Workshop on Economic Games and Mechanisms to Address Climate Change, Berkeley CA. May 2009.

- “Optimal Execution in Illiquid Markets”, Stochastic Analysis Seminar, Princeton University, Princeton, NJ. March 2009.

2008

- “Optimal Switching for Hidden Markov Models”, SIAM Financial Mathematics and Engineering Conference, New Brunswick, NJ. Nov 2008.
- “Optimal Risk Sharing under Distorted Probabilities”, Invited Speaker IFID/Fields Workshop on Financial Engineering for Actuarial Mathematics, Toronto, ON. Nov 2008.
- “Optimal Risk Sharing under Distorted Probabilities”, Vienna Institute of Finance Brown Bag Seminar, Vienna, Austria. Oct 2008.
- “Relative Hedging of Systematic Mortality Risk”, Invited Speaker International Symposium on Business and Industrial Statistics, Prague, Czech Republic. July 2008.
- “From American to Russian Options: Reduced Regret”, 13th International Symposium on Dynamic Games and Applications, Wroclaw, Poland. June 2008.
- “A Simulation Approach to Optimal Stopping under Partial Information”, Invited Speaker Workshop in Honor of Rene Carmona’s 60th Birthday, Princeton, NJ. June 2008.
- “Relative Hedging of Systematic Mortality Risk”, Workshop on Finance and Insurance, Bonn, Germany. March 2008.
- “Relative Hedging of Systematic Mortality Risk”, Actuarial Math Seminar, York University, Toronto, ON. Feb 2008.
- “Optimal Stopping and Optimal Switching with Partially Observed Poisson Processes”, Decision Science Seminar, Fuqua School of Business, Durham, NC. Jan 2008.
- “Financial Hedging of Operational Flexibility”, PIMS Financial Mathematics Seminar, University of British Columbia, Jan 2008.
- “Relative Hedging of Systematic Mortality Risk”, Risk Management and Insurance Seminar, Georgia State University, Atlanta, GA. Jan 2008.
- “Optimal Stopping and Optimal Switching with Partially Observed Poisson Processes”, Statistics and Applied Probability Colloquium, UC, Santa Barbara, CA. Jan 2008.

2007

- “Optimal Stopping and Optimal Switching with Partially Observed Poisson Processes”, Mathematics Colloquium, Claremont McKenna College, Claremont, CA. Dec 2007.
- “Relative Hedging of Systematic Mortality Risk”, Actuarial Math Seminar, Concordia University, Montreal, QC. Nov 2007.
- “Relative Hedging of Systematic Mortality Risk”, Financial Math Seminar, University of Toronto, Toronto, ON. Sep 2007.
- “Decision Timing with Partially Observed Poisson Processes”, Stochastic Processes and Applications 2007, Urbana, IL. Aug 2007.
- “Valuation of Energy Storage”, invited speaker, BIRS Workshop on Mathematics and the Environment, Banff, Canada. May 2007.

2006

- “Financial Hedging of Operational Flexibility”, Financial Math Seminar, University of Florida, Gainesville, FL. Dec 2006.
- “Financial Hedging of Energy Assets”, invited speaker, INFORMS 2006, Pittsburgh, PA. Nov 2006.
- “Financial Hedging of Operational Flexibility”, speaker and travel grant at 4th Bachelier World Congress, Tokyo, Japan. August 2006.
- “Financial Hedging of Operational Flexibility”, invited talk at SIAM Financial Mathematics and Engineering FME06 Conference, Boston, MA. July 2006.
- “Indifference Pricing of Annuities under Stochastic Mortality and Stochastic Interest Rates”, Actuarial and Financial Math Seminar, University of Michigan, Ann Arbor, MI. March 2006.
- “Optimizing operational management of energy assets”, poster presentation, Optimal Stopping Symposium, University of Manchester, Manchester, UK. Jan 2006.

2005

- “Optimal Switching with Applications to Finance”, presentation at Saint Flour Probability Summer School, Saint Flour, France. July 2005.
- “Optimal Switching with Applications to Finance”, speaker and travel grant. Stochastic Processes and Applications 2005, Santa Barbara, CA. June 2005.

2004

- “Stochastic Convenience Yield Model with Partial Observations and Exponential Utility”, invited speaker, INFORMS 2004, Denver, CO. Oct 2004.
- “Stochastic Convenience Yield Model with Partial Observations and Exponential Utility”, poster presentation. Workshop on Model Implementation, Algorithms and Software Issues. IMA, Minneapolis, MN. May 2004.
- “Stochastic Control for Energy Assets”, presentation, Princeton-Oxford Financial Mathematics Workshop, Oxford, UK. March 2004.

Service

- *Co-Director, Actuarial Program*, UC Santa Barbara, 2009-2010.
- *Committee Chair*, Probability Qualifying Exam, 2009.
- *Co-organizer*, Southern California Probability Symposium, Dec 2009.
- Faculty Legislature Department *Representative*, 2009-2010.
- *Co-organizer*, Third Western Conference in Mathematical Finance, Santa Barbara, CA, Nov 2009.
- *Co-organizer*. Minisymposium on Optimal Stopping and Impulse Control. SIAM Financial Mathematics Conference, New Brunswick, NJ, Nov 2008.
- *Main Local Organizer*, Workshop on Financial Engineering for Actuarial Mathematics, Ann Arbor MI, May 4-6, 2007.
- *Co-organizer*, Actuarial and Financial Math Seminar, University of Michigan, 2006-2008.
- *Referee* for Operations Research, SIAM Journal on Financial Mathematics, Mathematical Finance, Insurance: Mathematics and Economics, Mathematics of

Operations Research, Applied Mathematical Finance, Finance Research Letters, SIAM Journal on Mathematical Analysis, Journal of Banking and Finance, North American Actuarial Journal, Annals of Applied Probability, SIAM Journal on Scientific Computation, Methods of Mathematical Operations Research, IMA Journal of Management Mathematics, SIAM Book Reviews, Applied Mathematics Letters, ASTIN Bulletin.

- Contributor to Mathematical Reviews since 2005 (12 reviews as of Dec 2009).
- *Organizer*, ORFE Graduate Student Seminar, Summer 2003 and Fall 2004.
- *President*, Mathematics and Statistics Student Society, 1999-2000.
- *Member*, SIAM Activity Group on Financial Mathematics.

Teaching and Student Supervision

University of California, Santa Barbara:

- Pstat 223C, *Topics in Financial Mathematics: Stochastic Control*, Spring 2009.
- Pstat 210, *Measure-theoretic Probability* Fall 2009.
- Pstat 171 *Introduction to Mathematics of Fixed Income Markets* Fall 2009.
- Pstat 213BC, *Stochastic Processes*, Winter-Spring 2009.
- Pstat 223B, *Mathematical Finance*, Winter 2009;

University of Michigan:

- Math 526, *Stochastic Processes*, Winter 2007, Fall 2007, Winter 2008.
- Math 523, *Theory of Risk*, Fall 2006;
- Math 424, *Theory of Interest*, Fall 2005, Fall 2006, Spring 2007, Fall 2007;
- Math 423, *Mathematics of Finance*, Winter 2006;
- Math 115, *Calculus I*, Fall 2005;

Lecturer, "Fortunes Made and Lost: Introduction to Financial Mathematics", Michigan Math and Science Scholars Summer Camp, Ann Arbor, MI, July 2006, July 2007.

REU Supervisor: A. Kuehne, "Optimization of Hydroelectric Pumped Storage: An Extension of Optimal Switching", University of Michigan, Summer 2007.

Supervisor, Research Internship, B. Lin, "Dual Simulation Methods for Optimal Switching Problems in Energy Derivatives", UCSB, Summer 2009.

Supervisor, Research Internship, N. Lu, "Poisson Disorder Problems with Arbitrary Post-Disorder Rates", UCSB, Summer 2009.

PhD Committee member, W. Strong, 2009-present.