Erhan Bayraktar

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Contact Information

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Research Interests Mean-field games, stochastic analysis/control/games, applied probability, partial differential equations, Mathematical finance, insurance mathematics.

Employment

- (Full) Professor, Department of Mathematics, University of Michigan, September 2013–.
- Susan Meredith Smith Professor, September 2010-.
- Director of the Quantitative Finance and Risk Management Masters Program, Department of Mathematics, University of Michigan, Jan 2015–.
- Associate Professor (with Tenure), Department of Mathematics, University of Michigan, September 2010-August 2013.
- Assistant Professor (Tenure Track), Department of Mathematics, University of Michigan, September 2006 - August 2010.
- T. H. Hildebrandt Research Assistant Professor, Department of Mathematics, University of Michigan, September 2004 - August 2006.

Education

Princeton University, School of Engineering and Applied Science
Ph.D. in Electrical Engineering, 2004

- **Thesis Advisor:** Professor H. Vincent Poor (member of the U.S. National Academy of Sciences and the National Academy of Engineering, Fellow of the American Academy of Arts and Sciences, International Fellow of the Royal Academy of Engineering of the UK), Michael Henry Strater University Professor of Electrical Engineering.
- **Dissertation Title:** "Topics in Stochastic Processes and Their Applications".

M.A. in Electrical Enginering, 2002.

Middle East Technical University, Ankara, Turkey

B.S. in Mathematics, Electrical Engineering, 2000.

İzmir Fen Lisesi (Science High School of İzmir), 1996, İzmir, Turkey.

Grants

- National Science Foundation, total awarded: $1,784 428.
  –I was 112th among all mathematicians in the US who got NSF funding in the three year funding period starting at 2011 (2939 mathematicians), see `http://homepages.rpi.edu/~holmes/ranking.2011.html`, 3rd in the department after Ralf Spatzier and Karen Smith (who were the PIs on an RTG grant).
  1. National Science Foundation, Division of Mathematical Sciences, Applied Mathematics, Grant no: **DMS-DMS-2106556**, 2021- 2024 (PI), $330,000.
  2. National Science Foundation, Division of Mathematical Sciences, Applied Mathematics, Grant no: **DMS-1613170**, 2016 - 2020 (PI), $339,180.

3. National Science Foundation **CAREER Grant**, Grant no: **DMS-0955463**, $400,000. 2010-2015.
4. National Science Foundation, Division of Mathematical Sciences, Computational Foundations for Emerging Science Frontiers, Grant no: **DMS-1118673**, 2011-2015, $304,385 (my portion). (PI, joint with Lifeng Lai and H. Vincent Poor.)
5. National Science Foundation, Division of Mathematical Sciences, Applied Mathematics, Grant no: **DMS-0906257**, 2009 - 2012 (PI), $282,175.
6. National Science Foundation, Division of Mathematical Sciences, Applied Mathematics, Grant no: **DMS-1108593**, Workshop on Stochastic Analysis in Finance and Insurance, May 2011 (PI, joint with Mihai Sîrbu and Gordan Žitković), $40,000.
7. National Science Foundation, Division of Mathematical Sciences, Applied Mathematics/Coffes, Grant no: **DMS-0604491**, 2006 - 2009 (PI), $88,688.

- Other Grants

1. INTECH (Investment Management Firm in Princeton) grant to support the Financial Mathematics Seminar, 2013, $5,000.
2. CKER Research Grant, Society of Actuaries, 2012 (joint with Jenny Young), $25,000.
3. INTECH grant to support the Workshop on Stochastic Analysis in Finance and Insurance, May 2011, $10,000.
4. AERF Research Grant, The Actuarial Foundation, 2009, joint with Jenny Young, $20,000.
5. CKER Research Grant, Society of Actuaries, 2007, joint with Mike Ludkovski, $20,000.
6. Horace H. Rackham Faculty Grant and Felowship, University of Michigan, Ann Arbor, MI, 2005-2006.
7. Independent Contractor for the Institute for Quality Management. (Consultant to the US Army Pantheon Project) (Feb. 05 - Sep. 06).

Recent Honors

- Susan Meredith Smith Professorship, September 2010-.
- SIAM Activity Group on Financial Mathematics and Engineering (SIAG/FME) (the inaugural) Early Career Prize 2010.

Editorial Responsibilities

- **Corresponding editor** for SIAM Journal on Control and Optimization (SICON). (January 2018–).
- **Associate Editor for**
  - Applied Mathematics and Optimization. (July 2016–)
  - Frontiers of Mathematical Finance (December 2020–)
  - Mathematical Finance. (November 2013–)
  - Mathematics of Operations Research (MOR). (December 2013–)
  - SIAM Journal on Control and Optimization (SICON). (January 2014- December 2017).
  - SIAM Journal on Financial Mathematics (SIFIN). (January 2022-).

Membership

- Bachelier Finance Society
- SIAM and SIAG FME.

Ph.D. Students

1. Bo Yang (defended in August 2008), Executive Director, CVA (Counterparty Valuation Adjustment) desk strategiest, Morgan Stanley.
2. Hao Xing (defended in April 2009), Associate Professor, Department of Finance, Boston University.
3. Xueying Hu (AIM, defended in January 2012), Vice President, Market risk modeling, Goldman Sachs.
4. Ross Kravitz (defended in January 2013), Senior Data Scientist at Stripe.
5. Yu-Jui Huang (AIM, defended on April 30th 2013), Associate Professor at the Department of Applied Mathematics, University of Colorado-Boulder.
6. Yuchong Zhang (AIM, defended on March 31, 2015), Former Tenure track assistant professor at the University of Toronto. Now at Optiver.
7. Zhou Zhou (AIM, defended on April 1, 2015, Senior Lecturer (Associate professor) at the University of Sydney, School of Mathematics and Statistics.
8. Jiaqi Li (AIM, defended on August 16, 2016, Equity Derivatives Quant at CLSA, Hong Kong.).
9. Alexander Munk (defended on May 31, 2017; Quant/Financial Engineer at Chicago Trading Company).
10. Jia Guo (AIM, Defended on November 16, 2020, Risk Strategy Expert, JD Technology, Beijing).
11. Xin Zhang (Defended on date: March 24, 2021; Department of Mathematics, University of Vienna, June 2021–).
12. Jingjie Zhang (AIM, Defended on August 3, 2021; the School of Banking and Finance at the University of International Business and Economics, January 2022-).
13. April Nellis (AIM, Defended June 7, 2024, jointly with Asaf Cohen); at Johns Hopkins University Applied Physics Lab,
14. Hongyi Zhou (third year).
15. Ahmad Aghapour (AIM, first year)
16. Yiqing Zhang (AIM, first year).

AIM=Applied and Interdisciplinary Mathematics.

Postdocs

1. Fengyi Yuan (Fall 2024-)
2. Yuqiong Wang (Fall 2024-)
3. Jiamin Jian (Fall 2024-)
4. Chuhao Sun (Fall 2024- Summer 2025)
5. Xihao He (Winter 2024-)
6. Nikolaos Kolliopoulos (Fall 2023-)
7. Guillermo Alonso Alvarez (Fall 2023-)
8. Melih Iseri (Fall 2023-)
9. Ali Kara (Fall 2021- Summer 2024). Tenure Track Assistant Professor at Florida State University.
10. Donghan Kim (Fall 2021- Summer 2024) Tenure Track Assistant Professor at KAIST, South Korea.
11. Bingyan Han (Fall 2022-December 2023). Tenure Track Assistant Professor at the Hong-Kong University of Science and Technology.

12. Purba Das (Fall 2022-June 2023) Lecturer at King's College London.
13. Qi Feng (Fall 2021-June 2023). Tenure Track Assistant Professor at Florida State University.
14. Zhenhua Wang (Fall 2020-June 2023). Tenure Track Assistant Professor at Shangdong University.
15. Tao Chen (Fal 2020-June 2023). Quant at QRM.
16. Dominykas Norgilas (Fall 2019-June 2023). Tenure Track Assistant Professor at North Carolina State University.
17. Shuoqing Deng (Fall 2019- June 2022). Tenure Track Assistant Professor at the Hong-Kong University of Science and Technology.
18. Wei Yan (Fall 2020-June 2022). Citi Bank, Assistant vice president of Global Risk and Valuation, Tampa, Florida.
19. Thomas Bernhardt (Fall 2019-) Now a Lecturer (Assistant Professor) at the University of Manchester, UK, School of Mathematics.
20. Guayue Guo (Fall 2018-December 2020). Now a Tenure track assistant professor at Paris-Saclay.
21. Ruoyu Wu (Fall 2018-June 2020). Now a tenure track assistant professor at Iowa State University, Department of Mathematics.
22. Suman Chakraborty (Fall 2018-June 2020). Now a Research Associate at Eindhoven University of Technology.
23. Alexandros Saplaouras (Fall 2017-June 2020), Now a researcher at School of Applied Mathematical and Physical Sciences of National Technical University of Athens (NTUA).
24. Nicolas Hernandez (Fall 2017-Winter 2020). Now holding a CMM-CNRS chair of Excellence for Young Researchers at CMM, Universidad de Chile. .
25. Sebastian Hermann (Fall 2016-June 30th 2019), Lecturer (Assistant Professor) at the University of Manchester, UK, School of Mathematics.
26. Ibrahim Ekren (Fall 2017-August 2018), Now tenure track assistant professor at Florida State University.
27. Christian Keller (Fall 2015-Winter 2018), Now a tenure track assistant professor at University of Central Florida, Orlando.
28. Yavor Stoev (Fall 2015-Winter 2018), Now at JP Morgan, London.
29. Parsiad Azimzadeh (Winter 2018), PDT Partners, NYC.
30. Zhou Zhou (Fall 2017), Senior Lecturer (Associate professor) at the University of Sydney, School of Mathematics and Statistics.
31. Asaf Cohen (Fall 2014-July 2017), Tenure track assistant professor at the University of Michigan, Department of Mathematics.
32. Bahman Angoshtari (Fall 2014-July 2017), Assistant Professor at University of Miami, Department of Applied Mathematics.
33. Jinniao Qiu (January 2016- May 2017), Associate Professor at Calgary University, Department of Mathematics and Statistics.
34. Gu Wang (Fall 2013-June 2015.) Associate professor at WPI, Department of Mathematical Sciences.
35. Xiang Yu (Fall 2012-June 2015.) Associate professor at Hong Kong Polytechnic University, Department of Applied Mathematics.

36. Arash Fahim (Winter 2011-July 2013), Associate professor at Florida State University, Department of Mathematics.
37. Tom Emmerling (Fall 2009- July 2012), Senior Quantitative Risk Analyst at M&T Bank Corporation.
38. Qingshuo Song (Fall 2009), Associate Professor at the City University of Hong Kong, Department of Mathematics.
39. Song Yao (Fall 2008-June 2011), Associate Professor at the University of Pittsburgh, Department of Mathematics.

Published Journal Articles

My webpage contains the ArXiv links, see the journals' websites for the published versions.

1. Probabilistic cellular automata with local transition matrices: synchronization, ergodicity, and inference, with Fei Lu, Mauro Maggioni, Ruoyu Wu, Sichen Yang, to appear in **Bernoulli**.
2. Finite Approximations and Q learning for Mean Field Type Multi Agent Control, with Nicole Bauerle, Ali Devran Kara, to appear in **Applied Mathematics and Optimization.**
3. Equilibrium transport with time-inconsistent costs: An application to matching problems in the job market, with Bingyan Han, to appear in **Mathematics of Operations Research**.
4. Systemic robustness: a mean-field particle system approach, with Gaoyue Guo, Wenpin Tang, Yuming Paul Zhang, to appear in **Mathematical Finance**.
5. On Time-inconsistency in Mean-field Games, with Zhehua Wang, to appear in **Mathematical Finance**.
6. Non-parametric estimates for graphon mean-field particle systems, with Hongyi Zhou, to appear in **Bernoulli** .
7. Relaxed Equilibria for Time-Inconsistent Markov Decision Processes, with Yu-Jui Huang, Zhenhua Wang and Zhou Zhou, to appear in **Mathematics of Operations Research.**

2025:

8. Comparison of viscosity solutions for a class of second order PDEs on the Wasserstein space, with Ibrahim Ekren and Xin Zhang, **Communications in PDEs**, Volume 50, 2025 - Issue 4, Pages 570-613.
9. Convergence Rate of Particle System for Second-order PDEs On Wasserstein Space, with Ibrahim Ekren and Xin Zhang. **SIAM Journal on Control and Optimization**, , Volume 63, Issue 3, Jun 2025, Pages, 1515-1782.
10. Binomial-tree approximation for time-inconsistent stopping, with Zhenhua Wang and Zhou Zhou, **SIAM Journal on Financial Mathematics.** Vol. 16, No. 1, pp. 200–220.
11. Walsh spider diffusions as time changed multi-parameter processes, with Jingjie Zhang and Xin Zhang, **Stochastic Processes and Their Applications**, Volume 188, October 2025, 104672.
12. Approximation Schemes for POMDPs and Their Near Optimality, with Ali Devran Kara and Serdar Yuksel, **Journal of Systems Science and Complexity** (issue dedicated to the 80th birthday of Peter Caines), 38(1): 238–270.

13. Sequential optimal contracting in continuous time, with Guillermo Alonso Alvarez, Ibrahim Ekren, Liwei Huang, **Frontiers in Mathematical Finance**, March 2025, Volume 4, 114-139.
14. K-core in percolated dense graph sequences, with Suman Chakraborty and Xin Zhang, **Journal of Applied Probability**, J. Appl. Probab. 62, 298–318.
15. Applications of Schauder-type basis:estimating Holder exponent, fake fractional Brownian motion, with Purba Das and Donghan Kim, **Bernoulli** . 2025, Vol. 31, No. 2, 1084-1113.
16. Stability and Sample Complexity of Divergence Regularized Optimal Transport, with Stephan Eckstein and Xin Zhang, **Bernoulli** , Vol. 31, No. 1, 213-239.

2024:

17. Concentration of measure for Graphon particle system, with Donghan Kim, **Journal of/Advances in Applied Probability**, Volume 56 , Issue 4 , December 2024 , pp. 1279 - 1306.
18. Infinite Horizon Average Cost Optimality Criteria for Mean-Field Control, with Ali Kara. **to appear in SIAM Journal on Control and Optimization**, Vol 62 (5), 2776-280.
19. Countercyclical unemployment benefits: General Equilibrium Analysis of Transition Dynamics, with Indrajit Mitra and Jingjie Zhang, **Mathematics and Financial Economics**, Volume 18, 213- 232.
20. Stochastic Control/Stopping Problem with Expectation Constraints, with Song Yao, **Stochastic Processes and Their Applications**, Vol. 176, October 2024, 37 pages.
21. Quantifying an impact of dimensional change in Stochastic portfolio theory, with Donghan Kim, Abhishek Tilva, **Mathematical Finance**, 34 (3), 977-1021, July 2024.
22. Arbitrage theory in a market of stochastic dimension, with Donghan Kim, Abhishek Tilva, **Mathematical Finance**, 34 (3), 847-895, July 2024.
23. McKean-Vlasov equations involving hitting times: blow-ups and global solvability, with Gaoyue Guo, Wenpin Tang, Yuming (Paul) Zhang. **Annals of Applied Probability**, Vol. 34, No. 1B, 1600-1622.
24. Deep Signature Algorithm for Path-Dependent American option pricing, with Qi Feng, Zhaoyu Zhang, **SIAM Journal on Financial Mathematics**, Vol. 15, No. 1, pp. 194–214.
25. Optimal Stopping with Expectation Constraint, with Song Yao. **Annals of Applied Probability**, Vol. 34, No. 1B, 917-959
26. Supermartingale shadow couplings: the decreasing case, with Dominykas Norgilas and Shuoqing Deng. **Bernouilli**, Vol. 30, No. 1, 143-169.
27. Exponential Entropy dissipation for weakly self-consistent Vlasov-Fokker-Planck equations, with Qi Feng and Wuchen Li, **Journal of Nonlinear Science**, Vol 34, Article 7, 42 pages.

2023:

28. Existence of Markov Equilibrium Control in Discrete Time, with Bingyan Han, **SIAM Journal on Financial Mathematics**, 14 (4), SC60–SC71.

29. A Central Limit Theorem for Diffusion in Sparse Random Graphs, with Hamed Amini and Suman Chakraborty, **Journal of Statistical Physics**, 190, Article number: 57 (2023) .
30. Graphon Mean Field Systems, with Suman Chakraborty and Ruoyu Wu. **Annals of Applied Probability**, Vol. 33, No. 5, 3587-3619.
31. A Potential-based Construction of the Increasing Supermartingale Coupling, with Dominykas Norgilas and Shuoqing Deng. **Annals of Applied Probability**, Vol. 33, No. 5, 3803-3834, 2023.
32. A PDE approach for regret bounds under partial monitoring, with Ibrahim Ekren and Xin Zhang. **Journal of Machine Learning Research**, 24(299):1-24, 2023.
33. A neural network approach to high-dimensional optimal switching problem with jumps in energy markets, with Asaf Cohen and April Nellis. **SIAM Journal on Financial Mathematics**, Vol. 14, No. 4, pp. 1028-1061.
34. Nonparametric Adaptive Robust Control Under Model Uncertainty, with Tao Chen, **SIAM Journal on Control and Optimization**, 61 (5), 2737-2760.
35. An Approximate Reinforcement Learning Algorithm for Controlled Diffusion Processes, with Ali Kara, **SIAM Journal on Mathematics of Data Science (SIMODS)**, 5 (3), 615-638.
36. Equilibria of Time-inconsistent Stopping for One-dimensional Diffusion Processes, with Zhenhua Wang and Zhou Zhou, **Mathematical Finance**, 33 (3), 797-841.
37. A smooth variational principle on Wasserstein space with Ibrahim Ekren and Xin Zhang, **Proceedings of the AMS**, Volume 151 (9), 4089-4098.
38. Mean field control and finite dimensional approximation for regime-switching jump diffusions, with Alekos Cecchin and Prakash Chakraborty, **Applied Mathematics and Optimization**, Vol 88, Article 36, 35 pages.
39. Optimal Consumption under a Habit-Formation Constraint: the deterministic case, with Bahman Angoshtari and Jenny Young. **SIAM Journal on Financial Mathematics**, 14 (2), 557-597, 2023.
40. Propagation of Chaos of Forward-Backward Stochastic Differential Equations with Graphon Interactions, with Ruoyu Wu and Xin Zhang, **Applied Mathematics and Optimization**, Vol 88, Article 25, 44 pages.
41. Stability of Equilibria in Time-inconsistent Stopping Problems with Zhenhua Wang and Zhou Zhou. **SIAM Journal on Control and Optimization**, 61 (2), 674-696.
42. Supermartingale Brenier's Theorem with full marginals constraints, with Dominykas Norgilas and Shuoqing Deng. **Frontiers in Financial Mathematics**, 2 (2), 202-243. Also to appear in the **Peter Carr Gedenkschrift** and in
43. Data-Driven Nonparametric Robust Control under Dependence Uncertainty, with Tao Chen. **Frontiers in Financial Mathematics**, Volume 2 (1), 99-123. Also to appear in the **Peter Carr Gedenkschrift**.
44. Graphon particle system: Uniform-in-time concentration bounds, with Ruoyu Wu, **Stochastic Processes and Their Applications**, Volume 156, February 2023, Pages 196-225.
45. Solvability of Infinite horizon McKean-Vlasov FBSDEs in Mean Field Control Problems and Games, with Xin Zhang. **Applied Mathematics and Optimization**, 87, Article number: 13.

2022:

46. Finite state mean field games with Wright Fisher common noise as limits of N-player weighted games, with Asaf Cohen, Alekos Cecchin, and Francois Delarue. **Mathematics of Operations Research**, 47 (4), 2840-2890.
47. Stability of Time-inconsistent Stopping for One-dimensional Diffusion, with Zhenhua Wang and Zhou Zhou. **SIAM Journal on Financial Mathematics**, SIAM Journal on Financial Mathematics 13 (4), SC123-SC135.
48. Convergence of Optimal Investment Problems in the Vanishing Fixed Cost Limit, with Christoph Belak, Soren Christensen and Frank Seifried. **SIAM Journal on Control and Optimization**, Vol. 60, No. 5, pp. 2712-2736.
49. Disorder Detection with Costly Observations, with Erik Ekstrom and Jia Guo, to appear in **Journal of Applied Probability**, Volume 59 , Issue 2 , June 2022 , pp. 338 – 349.
50. On the Continuity of the Root Barrier, with Thomas Bernhardt, **Proceedings of the AMS**, 150 (7), 3133-3145, July 2022.
51. Stationarity and uniform in time convergence for the graphon particle system, with Ruoyu Wu. **Stochastic Processes and Their Applications,** Volume 150, August 2022, Pages 532-568 .
52. Path-dependent Hamilton-Jacobi equations with super-quadratic growth in the gradient and the vanishing viscosity method, with Christian Keller. **SIAM Journal on Control and Optimization**, 60 (3), 1690-1711.
53. Kr,s graph bootstrap percolation, with Suman Chakraborty, **Electronic Journal of Combinatorics**, Vol 29 (1), article number P1.46, 17 pages.
54. Optimal Investment and Consumption under a Habit-Formation Constraint, with Bahman Angoshtari and Jenny Young. **SIAM Journal on Financial Mathematics**, 13(1):321-352, March 2022.

2021:

55. A Note on Utility Maximization with Proportional Transaction Costs and Stability of Optimal Portfolios, with Christoph Czichowsky and Leonid Dolinskyi and Yan Dolinsky, **SIAM Journal on Financial Mathematics**, 12(4), SC115-125.
56. Terminal Ranking Games, with Yuchong Zhang, **Mathematics of Operations Research**. Vol. 46, No. 4, November 2021, pp. 1349-1365.
57. Mean field interaction on random graphs with dynamically changing multi-color edges, with Ruoyu Wu, **Stochastic Processes and Their Applications**, Volume 141, November 2021, Pages 197-244.
58. A Macroeconomic SIR Model for COVID-19, with Asaf Cohen and April Nellis, **Mathematics**, 9 (16), Special Issue on Mathematics on Pandemic, 24 pages
59. Transport plans with domain constraints, with Xin Zhang and Zhou Zhou, **Applied Mathematics and Optimization**, 84(1), 1131-1158.
60. Prediction against limited adversary, with Ibrahim Ekren and Xin Zhang, **Journal of Machine Learning Research**, 22(72):1-33.
61. Finite state Mean Field Games with Wright-Fisher common noise, with Asaf Cohen, Alekos Cecchin, and Francois Delarue, **Journal de Mathématiques Pures et Appliquées**, 147, 98-162.
62. Strong equivalence between metrics of Wasserstein type, with Gaoyue Guo, **Electronic Communications in Probability**, 26, 1-13.

63. Embedding of Walsh Brownian Motion, with Xin Zhang, **Stochastic Processes and Their Applications**, Stochastic Processes and their Applications Volume 134, April 2021, Pages 1-28.
64. Equilibrium concepts for time-inconsistent stopping problems in continuous time, with Jingjie Zhang and Zhou Zhou, **Mathematical Finance**, Volume 31, Issue 1, January, Pages 508-530.
65. Asymptotics for Small Nonlinear Price Impact: a PDE Homogenization-Approach to the Multidimensional Case, Ibrahim Ekren and Thomas Caye, **Mathematical Finance**, Volume 31, Issue 1, January, Pages 36-108.
66. Malicious Experts versus the multiplicative weights algorithm in online prediction, with H. Vincent Poor and Xin Zhang, **IEEE Transactions on Information Theory**, Volume: 67, Issue: 1, 559 - 565.

2020:

67. On the asymptotic optimality of the comb strategy for prediction with expert advice, with Ibrahim Ekren and Yili Zhang, **Annals of Applied Probability**, 30 (6), 2517-2546.
68. Extended Weak Convergence and Utility Maximization with Proportional Transaction Costs, with Leonid Dolinskyi, Yan Dolinsky, **Finance and Stochastics**, 24, 1013-1034.
69. Continuity of Utility Maximization under Weak Convergence, with Yan Dolinsky and Jia Guo, **Mathematics and Financial Economics**, 14(4), 725-757..
70. Finite-Time 4-Expert Prediction Problem, with Ibrahim Ekren and Xin Zhang, **Communications in Partial Differential Equations**, 45 (7), 714-757.
71. On non-uniqueness in mean field games, with Xin Zhang, to appear in **Proceedings of the AMS**, Vol 148, 9, 4091-4106.
72. On the adversarial robustness of robust estimators, with Lifeng Lai, **IEEE Transactions on Information Theory**, 66 (8), 5097-5109.
73. On the quasi-sure superhedging duality with frictions, with Matteo Burzoni, **Finance and Stochastics**, Volume 24, Issue 1, pp 249–275.

2019:

74. Large tournament games, with Jaksa Cvitanic and Yuchong Zhang, **Annals of Applied Probability**, Vol. 29, No. 6, 3695-3744.
75. Controlled Reflected SDEs and Neumann Problem for Backward SPDEs, with Jinniao Qiu, **Annals of Applied Probability**, Vol. 29, No. 5, 2819-2848.
76. Time Consistent Stopping for the Mean-Standard Deviation Problem – the Discrete time case, with Jingjie Zhang and Zhou Zhou, **SIAM Journal on Financial Mathematics**, 10(3), 667-697.
77. On the controller-stopper problems with controlled jumps, with Jiaqi Li, **Applied Mathematics and Optimization**, 80 (1), 195?222.
78. Optimal Dividend Distribution Under Drawdown and Ratcheting Constraints on Dividend Rates, with Bahman Angoshtari and Jenny Young, **SIAM Journal on Financial Mathematics**, 10(2), 547-577.
79. No-arbitrage and hedging with liquid American options, with Zhou Zhou, **Mathematics of Operations Research**, 44 (2), 468-486.

80. Optimal Investment with Unbounded Random Endowments and Transaction Costs: Duality Theory and Connections to the Shadow Price Process, with Xiang Yu, **Mathematics and Financial Economics**, March 2019, Volume 13, Issue 2, 253-286.
81. High-order Bellman Equations and weakly chained dominant tensors, with Parsiad Azimzadeh, **SIAM Journal on Matrix Analysis and Applications**, 40(1), 276-298.
82. Distribution-Constrained Optimal Stopping, with Christopher W. Miller, **Mathematical Finance**, Volume 29, Issue1, Pages 368-406.
83. Rate Control Problem under Heavy Traffic with Strategic Servers, with Amarjit Budhiraja, Asaf Cohen, **Annals of Applied Probability**, 2019, Vol. 29, No. 1, 1-35.

2018:

84. Path-dependent Hamilton-Jacobi equations in infinite dimensions, (with Christian Keller), **Journal of Functional Analysis**, Volume 275, Issue 8, 15 October 2018, Pages 2096-2161.
85. Convergence of approximation schemes for weakly nonlocal second order equations, with Parsiad Azimzadeh and George Labahn, **SIAM Journal on Control and Optimization**, 56(6), 3994-4016.
86. A numerical scheme for a mean field game in some queuing systems based on Markov chain approximation method, with Amarjit Budhiraja and Asaf Cohen, **SIAM Journal on Control and Optimization**, 56(6), 4017-4044.
87. On Zero-sum Optimal Stopping Games, with Zhou Zhou, **Applied Mathematics and Optimization**, December 2018, Volume 78, Issue 3, 457-468.
88. Analysis of a Finite State Many Player Game Using its Master Equation , with Asaf Cohen, **SIAM Journal on Control and Optimization**, 56(5), 3538-3568.
89. Mini-Flash Crashes, Model Risk, and Optimal Execution, with Alex Munk, **Market Microstructure and Liquidity**, Vol 4, No.1, 44 pages.
90. On Market Viability with Proportional Transaction Cost, with Xiang Yu, to appear in **Mathematical Finance**, 28 (3), 800-838.
91. Recombining Tree Approximations for Optimal Stopping for Diffusions, with Yan Dolinsky and Jia Guo, **SIAM Journal on Financial Mathematics**, 9(2), 602-633.
92. Quantile Hedging in a semi-static market with model uncertainty, with Gu Wang, **Mathematical Methods of Operations Research**, April 2018, Volume 87, Issue 2, 197-227.
93. Efficient Byzantine Sequential Change Detection, with Georgios Fellouris and Lifeng Lai, **IEEE Transactions on Information Theory**, 64 (5), 1-15, May 2018.
94. Risk Sensitive Control of the Lifetime Ruin Problem, with Asaf Cohen, **Applied Mathematics and Optimization**, Volume 77, Issue 2, 229-252.
95. Martingale optimal transport with stopping, Alexander Cox and Yavor Stoev, **SIAM Journal on Control and Optimization**, 56(1), 417–433.
96. Solvability of the non-linear Dirichlet problem with Integro-Differential operators, with Qingshuo Song, **SIAM Journal on Control and Optimization**, 56 (1):292-315.
97. Randomized dynamic programming principle and Feynman-Kac representation for optimal control of McKean-Vlasov dynamics, with Andrea Cosso and Huyên Pham, **Transactions of the American Mathematical Society**, Volume 370, Number 3, March 2018, Pages 2115-2160.

2017:

98. On Arbitrage and Duality under Model Uncertainty and Portfolio Constraints, with Zhou Zhou, **Mathematical Finance**, Vol 27, No. 4, 988-1012.
99. Super-hedging American Options with Semi-static Trading Strategies under Model Uncertainty, with Zhou Zhou, **International Journal of Theoretical and Applied Finance**, 20 (6), 10 pages.
100. On the Robust Dynkin game, with Song Yao, **Annals of Applied Probability**, Vol. 27, No. 3, 1702-1755.
101. High-Roller Impact: A Large Generalized Game Model of Parimutuel Wagering, with Alex Munk, **Market Microstructure and Liquidity**, 2017, 3 (1), 45 pages.
102. Ergodicity of robust switching control and nonlinear system of quasi variational inequalities, with Andrea Cosso and Hûyen Pham, **SIAM Journal on Control and Optimization**, 2017, 55(3), 1915?1953.
103. Optimal Stopping with Random Maturity under Nonlinear Expectations, with Song Yao, **Stochastic Processes and Their Applications**, 2017, 127(8), 2586-2629.

2016:

104. Arbitrage, hedging and utility maximization using semi-static trading strategies with American options, with Zhou Zhou, **Annals of Applied Probability**, Vol. 26, No. 6, 3531-3558.
105. A rank based mean field game in the strong formulation, with Yuchong Zhang, **Electronic Communications in Probability**, 2016, Vol. 21, paper no. 72, 1-12.
106. Robust feedback switching control: dynamic programming and viscosity solutions, with Andrea Cosso and Hûyen Pham, **SIAM Journal on Control and Optimization**, 54(5), 2594–2628, October 2016.
107. Stochastic Perron for Stochastic Target Problems, with Jiaqi Li, **Journal of Optimization Theory and Applications**, September 2016, Volume 170, Issue 3, 1026–1054
108. Fundamental Theorem of Asset Pricing under Transaction costs and Model uncertainty, with Yuchong Zhang, **Mathematics of Operations Research**, 41 (3), 1039 -1054.
109. Optimally Investing to Reach a Bequest Goal, with Jenny Young, **Insurance: Mathematics and Economics**, volume 70, September 2016, 1-10.
110. Minimizing the Probability of Lifetime Drawdown under Constant Consumption, with Bahman Angoshtari and Jenny Young, **Insurance: Mathematics and Economics**, Volume 69, July 2016, 210-223.
111. Optimal Investment to Minimize the Probability of Drawdown, with Bahman Angoshtari and Jenny Young, **Stochastics**, Volume 88 (6), 946-958.
112. On an Optimal Stopping Problem of an Insider, with Zhou Zhou, **Teoriya Veroyatnoste i i ee Primeneniya** 61 (1), 181-186; also published as **Theory of Probability and Its Applications** 61 (1) , 133-139, 2017 (SIAM Version).
113. On a Stopping Game in continuous time, with Zhou Zhou, **Proceedings of the American Mathematical Society**, 144 (8), 3589-3596.
114. An α-Stable Limit Theorem Under Sublinear Expectation, with Alex Munk, **Bernoulli**, 22 (4), 2548-2578, 2016.

115. Purchasing Term Life Insurance to Reach a Bequest while Consuming, with David Promislow and Jenny Young, **SIAM Journal on Financial Mathematics**, 7(1), 183-214.

116. Stochastic Perron for Stochastic Target Games, with Jiaqi Li, **Annals of Applied Probability**, 26 (2), 1082-1110.

2015:

117. Minimizing the Expected Lifetime Spent in Drawdown under Proportional Consumption, with Bahman Angoshtari and Jenny Young, **Finance Research Letters**, Volume 15, November 2015, Pages 106-114.

118. Doubly Reflected BSDEs with Integrable Parameters and Related Dynkin Games, with Song Yao, **Stochastic Processes and Their Applications**, 125 (12), 4489-4542.

119. Weak reflection principle for Lévy processes, with Sergey Nadtochiy, **Annals of Applied Probability**, Annals of Applied Probability, 25 (6), 3251-3294.

120. Purchasing Term Life Insurance to Reach a Bequest Goal: Time-Dependent Case, with David Promislow and Jenny Young, **North American Actuarial Journal,** 19 (3), 224-236.

121. Comparing the G-Normal Distribution to its Classical Counterpart, with Alexander Munk, **Communications on Stochastic Analysis**, 9 (1), 1-18.

122. On hedging American options under model uncertainty, with Yu-Jui Huang and Zhou Zhou, **SIAM Journal on Financial Mathematics (SIFIN)**, 6(1), 425-447.

123. Byzantine Fault Tolerant Distributed Quickest Change Detection, with Lifeng Lai, **SIAM Journal on Control and Optimization**, 53(2), 575-591.

124. Quickest Detection with Discretely Controlled Observations, with Ross Kravitz, **Sequential Analysis**, 34 (1), 77-133.

125. Stochastic Perron's Method for the Probability of lifetime ruin problem under transaction costs, with Yuchong Zhang, **SIAM Journal on Control and Optimization**, 53(1), 91-113.

126. Minimizing the Probability of Lifetime Ruin Under Ambiguity Aversion, with Yuchong Zhang, to appear in **SIAM Journal on Control and Optimization**, 53(1), 58-90, 2015.

2014:

127. A note on the Fundamental Theorem of Asset Pricing under model uncertainty, with Yuchong Zhang and Zhou Zhou, **Risks**, 2(4), 425-433.

128. On the Robust Optimal Stopping Problem, with Song Yao, **SIAM Journal on Control and Optimization**, 52(5), 3135-3175.

129. Liquidation in Limit Order Books with Controlled Intensity, with Mike Ludkovski, **Mathematical Finance**, Volume 24, Issue 4, pages 627-650, October.

130. Bayesian Quickest Change Point Detection with Sampling Right Constraints, with Jun Geng and Lifeng Lai, **IEEE Transactions on Information Theory**, Vol. 60, N0. 10, 6474–6490.

131. Purchasing Life Insurance to Reach a Bequest Goal, with David Promislow and Jenny Young, **Insurance:Mathematics and Economics**, Volume 58, 204-216, 2014.

132. Quickest Search over Brownian Channels, with Ross Kravitz, **Stochastics**, Volume 86, Issue 3, 473-490, 2014.

133. A Stochastic Approximation for Fully Nonlinear Free Boundary Problems, with Arash Fahim, **Numerical Methods for Partial Differential Equations**, Volume 30, Issue 3, pages 902-929, May 2014.

134. A Note on Applications of Stochastic Ordering to Control Problems in Insurance and Finance, with Nicole Bäuerle, **Stochastics**, Volume 86, Issue 2, 330-340.

135. Stochastic Perron's Method and Verification without smoothness using viscosity comparison: Obstacle Problems and Dynkin Games, with Mihai Sirbu, **Proceedings of the American Mathematical Society**, 142 (4), 1399-1412, 2014.

136. On controller-stopper problems with jumps and their applications to indifference pricing of American options, with Zhou Zhou, **SIFIN** (SIAM Journal on Financial Mathematics), 5 (1), 20-49, 2014.

137. Optimal reinsurance and investment with unobservable claim size and intensity, with Zhibin Liang, **IME (Insurance: Mathematics and Economics)**, 55 (March 2014), Pages 156-166.

138. Optimal dividends in the dual model under transaction costs, with Andreas Kyprianou and Kazutoshi Yamazaki, **Insurance: Mathematics and Economics**, 54, 133-143, 2014.

139. On the Existence of Consistent Price Systems, with Mikko S. Pakkanen and Hasanjan Sayit, **Stochastic Analysis and Applications**, 32, 152-162, 2014.

2013:

140. Stochastic Perron's method for Hamilton-Jacobi-Belman Equations, with Mihai Sîrbu, **SICON (SIAM Journal on Control and Optimization)**, 51(6), 4274-4294.

141. Robust maximization of asymptotic growth under covariance uncertainty, with Yu-Jui Huang, **Annals of Applied Probability**, 2013, Vol. 23, No. 5, 1817–1840.

142. On optimal dividends in the dual model, with Andreas Kyprianou and Kazutoshi Yamazaki, **ASTIN Bulletin**, 2013, 43 (3) , pp. 359-372.

143. On the Impulse Control of Jump Diffusions, with Tom Emmerling and Jose-Luis Menaldi, **SIAM Journal on Control and Optimization**, 2013, 51(3), 2612–2637.

144. Life Insurance Purchasing to Maximize Utility of Household Consumption, with Virginia (Jenny) R. Young, **NAAJ**, 2013, 17 (2), 1-22.

145. A Weak Dynamic Programming Principle for Zero-Sum Stochastic Differential Games with Unbounded Controls, with Song Yao, **SIAM Journal on Control and Optimization**, 2013, 51(3), 2036–2080.

146. On the Multi-Dimensional Controller and Stopper Games, with Yu-Jui Huang, **SIAM Journal on Control and Optimization**, 2013, 51 (2), 1263-1297.

147. Stability of exponential utility maximization with respect to market perturbations, with Ross Kravitz, **Stochastic Processes and Their Applications**, 2013, 123 (5), 1671-1690.

2012:

148. On outperforming the market portfolio with a given probability, with Yu-Jui Huang and Qingshuo Song, **Annals of Applied Probability**, 2012, 22 (4) 1465–1494.

149. Stochastic Perron's method and verification without smoothness using viscosity comparison: the linear case, with Mihai Sirbu, **Proceedings of the American Mathematical Society**, 2012, 140, 3645-3654.

150. Regularity of the optimal stopping problem for jump diffusions, with Hao Xing, **SIAM Journal on Control and Optimization**, 50 (3), 1337-1357, 2012.
151. Valuation equations for stochastic volatility models, with Kostas Kardaras and Hao Xing, **SIAM Journal on Financial Mathematics**, 2012, 3, 351-373.
152. Strict Local Martingale Deflators and Pricing American Call-Type Options, with Kostas Kardaras and Hao Xing, **Finance and Stochastics**, 2012, 16(2), 275-291.
153. Quadratic Reflected BSDEs with Unbounded Obstacles, with Song Yao, **Stochastic Processes and Their Applications**, 2012, 122, 1155-1203.

2011:

154. Proving the Regularity of the Minimal Probability of Ruin via a Game of Stopping and Control, with Virginia R. Young, **Finance and Stochastics**, 15 (4), 785-818.
155. Optimal Trade Execution in Illiquid Markets, with Mike Ludkovski, **Mathematical Finance** 2011, 21(4), 681-701.
156. A Unified Framework for Pricing Credit and Equity Derivatives, with Bo Yang, **Mathematical Finance**, 2011, 21 (3), pp. 493-517.
157. Minimizing the Probability of Lifetime Ruin under Stochastic Volatility, with Xueying Hu and Jenny Young, **Insurance: Mathematics and Economics**, Volume 49, Issue 2, September 2011, Pages 194-206 .
158. On the Perpetual American Put Options for Level Dependent Volatility Models with Jumps, **Quantitative Finance**, 2011, 11 (3), 335-341.
159. Optimal Stopping for Nonlinear Expectations – Part I, with Song Yao, **Stochastic Processes and Their Applications**, 2011, 121 (2), 185-211.
160. Optimal Stopping for Nonlinear Expectations – Part II, with Song Yao, **Stochastic Processes and Their Applications**, 2011, 121 (2), 212-264.
161. Pricing Asian Options for Jump Diffusions, with Hao Xing, **Mathematical Finance**, 2011, 21 (1), 117-143.
162. On the Continuity of Stochastic Exit Time Control Problems, with Qingshuo Song and Jie Yang, **Stochastic Analysis and Applications**, 2011, 29, 1-13.

2010:

163. Optimal Stopping for Dynamic Convex Risk Measures, with Ioannis Karatzas and Song Yao, **llinois Journal of Mathematics**, A special volume in honor of Donald Burkholder, 54 (3), 1025-1067 (Fall 2010).
164. On the Stickiness Property, with Hasanjan Sayit, **Quantitative Finance**, 2010, 10 (10), 1109-1112.
165. On the uniqueness of classical solutions of Cauchy problems, with Hao Xing, **Proceedings of the American Mathematical Society**, 2010, 138 (6), 2061-2064.
166. On the One-Dimensional Optimal Switching Problem, with Masahiko Egami, **Mathematics of Operations Research**, 2010, 35 (1), 140-159.
167. Inventory Management with Partially Observed Non-stationary Demand, with Mike Ludkovski, **Annals of Operations Research**, 2010, 176 (1), 7-39.
168. Optimal investment strategy to minimize occupation time, with Virginia R. Young, **Annals of Operations Research**, 2010, 176 (1), 389-408.

169. A Unified Treatment of Dividend Payment Problems under Fixed Cost and Implementation Delays, with Masa Egami, **Mathematical Methods of Operations Research**, 2010, 71 (2), 325-351.

170. No Arbitrage Conditions For Simple Trading Strategies, with Hasanjan Sayit, **Annals of Finance**, 2010, 6 (1), 147-156.

2009:

171. Analysis of the Optimal Exercise Boundary of American Options for Jump Diffusions, with Hao Xing, **SIAM Journal on Mathematical Analysis**, 2009, 41 (2), 825-860.

172. A Proof of the Smoothness of the Finite Time Horizon American Put Option for Jump Diffusions, **SIAM Journal on Control and Optimization**, 2009, 48, (2), 551-572.

173. Pricing American Options for Jump Diffusions by Iterating optimal stopping problems for Diffusions, with Hao Xing, **Mathematical Methods of Operations Research**, (2009), 70 (3), 505-525.

174. Multi-scale Time- Changed Birth Processes for Pricing Multi-Name Credit Derivatives, with Bo Yang, **Applied Mathematical Finance**, 2009, 16 (5), 429-449.

175. Valuation of Mortality Risk via the Instantaneous Sharpe Ratio: Applications to Life Annuities, with Moshe Milevsky, David Promislow and Virginia Young, **Journal of Economic Dynamics and Control**, 2009, 33 (3), 676-691.

176. A Sequential Tracking of a Hidden Markov Chain Using Point Process ObservationsÓ, with Mike Ludkovski, **Stochastic Processes and their Applications**, 2009, 119 (6), 1792-1822.

177. Online Change Detection for a Poisson Process with a Phase-Type Change-Time Prior Distribution, with Semih Sezer, **Sequential Analysis**, 2009, 28 (2), 218-250.

178. Relative Hedging of Systematic Mortality Risk, with Mike Ludkovski, **North American Actuarial Journal (NAAJ)**, 2009, Volume 13 (1), 106-140.

179. Optimal Deferred Life Annuities to Minimize the Probability of Lifetime RuinÓ with Virginia Young, **NAAJ**, 2009, Volume 13 (1), 141-154.

180. Minimizing the Lifetime Shortfall or Shortfall at DeathÓ, with Virginia R. Young, **Insurance: Mathematics and Economics**, 2009, 44 (3), 447-458.

2008:

181. Maximizing Utility of Consumption Subject to a Constraint on the Probability of Lifetime Ruin, Virginia R. Young, **Finance and Research Letters**, 2008, 5 (4), 204-212.

182. A Note on Pricing Options on Defaultable Stocks, **Applied Mathematical Finance**, 2008, 15 (3), 277-304.

183. Minimizing the Probability of Lifetime Ruin under Random Consumption, with Kristen Moore and Virginia R. Young, **NAAJ**, 2008, 12 (4), 384-400.

184. Minimizing the Probability of Ruin when Consumption is RatchetedÓ, with Virginia R. Young, **NAAJ**, 2008, 12 (4), 428-442.

185. Pricing Options in Incomplete Equity Markets via the Instantaneous Sharpe Ratio, with Virginia R. Young, **Annals of Finance**, 2008, 4 (4), 399-429.

186. An Analysis of Monotone Follower Problems for Diffusion Processes, with Masahiko Egami, **Mathematics of Operations Research**, 2008, 33 (2), 336-350.

187. Mutual Fund Theorems when Minimizing the Probability of Lifetime Ruin, with Virginia R. Young, **Finance and Research Letters**, 2008, 5 (2), 69-78.

188. Optimal Time To Change Premiums, with H. Vincent Poor, **Mathematical Methods of Operations Research**, 2008, 68 (1), 125-158.

189. Optimizing Venture Capital Investments in a Jump Diffusion Mode, with Masa Egami, **Mathematical Methods of Operations Research**, 2008, 67 (1), 21-42.

190. Queueing Theoretic Approaches to Financial Price Fluctuations, with Ulrich Horst and Ronnie Sircar, **Handbooks in OR&MS: Financial Engineering** (Elsevier), 2008, vol 15, eds. John Birge and Vadim Linetsky.

2007:

191. Correspondence between Lifetime Minimum Wealth and Utility of Consumption, with Virginia R. Young, **Finance and Stochastics**, 2007, 11 (2), 213-236.

192. The effects of decision delay on decision making under uncertainty, with Masa Egami, **Stochastic Processes and Their Applications**, 2007, 117 (3), 333-358.

193. Quickest Detection of a Minimum of Two Poisson Disorder Times, with H. Vincent Poor, **SIAM Journal on Control and Optimization**, 2007, 46 (1), 308-331.

194. Minimizing the Probability of Lifetime Ruin under Borrowing Constraints, with Virginia R. Young, **Insurance: Mathematics and Economics**, 2007, 41: 196-221.

195. Hedging Life Insurance with Pure Endowments, with V. R. Young, **Insurance: Mathematics and Economics**, 2007, 40 (3), 435-444.

2006:

196. Adaptive Poisson Disorder Problem, with Savas Dayanik and Ioannis Karatzas, **Annals of Applied Probability**, 2006, 16 (3), 1190-1261.

197. A Limit Theorem for Financial Markets with Inert Investors with Ulrich Horst and Ronnie Sircar, **Mathematics of Operations Research**, 2006, 31 (4), 789-810.

198. Poisson Disorder Problem with Exponential Penalty for Delay, with Savas Dayanik, **Mathematics of Operations Research**, 2006, 31 (2), 217-233.

199. Projecting the Forward Rate Flow onto a Finite Dimensional Manifold, with Li Chen and H. Vincent Poor, **International Journal of Theoretical and Applied Finance**, 2006, 5, 777-785.

2005:

200. Stochastic Differential Games in a Non-Markovian Setting, with H. Vincent Poor, **SIAM Journal on Control and Optimization**, 2005, 43 (5), 1737 1756.

201. Standard Poisson Disorder Problem Revisited, with Savas Dayanik and Ioannis Karatzas, **Stochastic Processes and Their Applications**, 2005, 115 (9), 1437-1450.

202. Consistency Problems for Jump-Diffusion Models, with Li Chen and H.Vincent Poor, **Applied Mathematical Finance**, 2005, 12 (2), 101-119.

203. Arbitrage in Fractal Modulated Markets When the Volatility is Stochastic, with H. Vincent Poor, **International Journal of Theoretical and Applied Finance**, 2005, 8 (3), 1-18.

204. Prediction and Tracking of Long Range Dependent Sequences, with H. Vincent Poor and Raghuveer Rao, **Systems & Control Letters**, 2005, 54 (11), 1083-1090.

2004:

205. Estimating the Fractal Dimension of the S&P 500 Index Using Wavelet Analysis, with H. Vincent Poor and Ronnie Sircar, **International Journal of Theoretical and Applied Finance**, 2004, 7 (5), 615-643.

Publications by Journal Name

- Annals of Applied Probability (15)
- Annals of Finance (2)
- Annals of Operations Research (2)
- Applied Mathematical Finance (3)
- Applied Mathematics and Optimization (8)
- Astin Bulletin (1)
- Bernoulli (6)
- Communications on Partial Differential Equations (2)
- Communications on Stochastic Analysis (1)
- Electronic Communications in Probability (2)
- Electronic Journal of Combinatorics (1)
- Finance and Stochastics (5)
- Finance Research Letters (3)
- Frontiers in Financial Mathematics (3)
- IEEE Transactions on Information Theory (4)
- Illinois Journal of Mathematics (1)
- Insurance: Mathematics and Economics (9)
- International Journal of Theoretical and Applied Finance (4)
- Journal of/Advances in Applied Probability (3)
- Journal de Mathématiques Pures et Appliquées (1)
- Journal of Economic Dynamics and Control (1)
- Journal of Functional Analysis (1)
- Journal of Machine Learning Research (2)
- Journal of Nonlinear Science (1)
- Journal of Optimization Theory and Applications (1)
- Journal of Systems Science and Complexity (1)
- Journal of Statistical Physics (1)
- Market Microstructure and Liquidity (2)
- Mathematics (1)
- Mathematical Finance (14)
- Mathematical Methods of Operations Research (5)
- Mathematics and Financial Economics (3)
- Mathematics of Operations Research (10)
- North American Actuarial Journal (6)
- Numerical Methods for Partial Differential Equations (1)

- Proceedings of the American Mathematical Society (7)
- Quantitative Finance (2)
- Risks (1)
- Sequential Analysis (2)
- SIAM Journal on Control and Optimization (25)
- SIAM Journal on Financial Mathematics (15)
- SIAM Journal on Mathematical Analysis (1)
- SIAM Journal on Mathematics of Data Science (SIMODS) (1)
- SIAM Journal on Matrix Analysis and Applications (1)
- Stochastics (3)
- Stochastic Analysis and Applications (2)
- Stochastic Processes and Their Applications (15)
- Systems and Control Letters (1)
- Theory of Probability and Its Applications (1)
- Transactions of the American Mathematical Society (1)

Publications in Collections

- Handbook of Operations Research and Management Science, Vadim Linetsky, John Birge editors, 2008. (1)
- Peter Carr Gedenkschrift, edited by Dilip Madan and Robert Jarrow (2), 2022.

Conference Publications

1. Near Optimality of Approximations for POMPDs with Continuous Spaces, with Ali Devran Kara and Serdar Yuksel, **61st IEEE Conference on Decision and Control**, 2022.
2. Quickest Change Point Detection with Sampling Right Constraints, with Jun Geng and Lifeng Lai, **Proceedings of the 50th Allerton Conference on Communication, Control, and Computing**, October 2012.
3. Proving the Regularity of the Minimal Probability of Ruin via a Game of Stopping and Control (slides), **Proceedings of the 6th Conference in Actuarial Science and Finance on Samos**, 2010.
4. Pricing American Options for Jump Diffusions with Iterated SOR with Hao Xing, **Proceedings of Financial Engineering and Applications-2007**, Berkeley, September 2007.
5. Quickest Detection of a Minimum of Disorder Times with H. V. Poor, **Proceedings of the IEEE Conference on Decision and Control and European Control Conference ECC 2005**, Seville, December 12-15.
6. Multi-source Change Detection for Compund Poisson Processes, with H. V. Poor, **Proceedings of 43th Annual Allerton Conference on Communication, Control, and Computing**, Allerton, Illinois, September 28-30, 2005.
7. Prediction and Tracking of Long Range Dependent Sequences, with H. Vincent Poor and R. Rao, **Proceedings of the 38th Annual Conference on Information Sciences and Systems**, Princeton, March 2004.
8. Signal Processing Models for Discrete-Time Self-Similar and Multifractal Processes, with Raghuveer Rao, Seungsin Lee, and H. Vincent Poor, **Proceedings of the 37th Asilomar Conference on Signals, Systems and Computers**, California, Nov. 9-12 , 2003.
9. Efficient Estimation of the Hurst Parameter in High Frequency Financial Data with Seasonalities Using Wavelets, with H. Vincent Poor and K. Ronnie Sircar, **Proceedings of the 2003 IEEE International Conference on Computational Intelligence for Financial Engineering**, Hong-Kong, March, 20-23, 309 -316.

Recently completed papers

The ArXiv links are available on my website.

1. Comparison for semi-continuous viscosity solutions for second order PDEs on the Wasserstein space, with Ibrahim Ekren, Xihao He and Xin Zhang.
2. The Learning Approach to Games, with Melih İşeri
3. Uniform-in-time weak propagation of chaos for consensus-based optimization, with Hongyi Zhou and Ibrahim Ekren.
4. Ergodicity and turnpike properties of linear-quadratic mean field control problems, with Jiamin Jian.
5. Viscosity Solutions of Fully second-order HJB Equations in the Wasserstein Space, with Erhan Bayraktar, Hang Cheung, Ibrahim Ekren, Jinniao Qiu, Ho Man Tai
6. Two-fund separation under hyperbolically distributed returns and concave utility function, Nuerxiati Abudurexiti, Erhan Bayraktar, Takaki Hayashi, Hasanjan Sayit
7. On the mean-field limit of diffusive games through the master equation: extreme value analysis, with Nikolaos Kolliopoulos.
8. Learning with Linear Function Approximations in Mean-Field Control, with Ali Devran Kara.
9. Generalizing Super/Sub MOT using weak L1 transport, with Dominykas Norgilas
10. DEX Specs: A Mean Field Approach to DeFi Currency Exchanges, with Asaf Cohen and April Nellis.
11. The McCormick martingale optimal transport, with Binghan Yan and Dominykas Norgilas.
12. Fitted Value Iteration Methods for Bicausal Optimal Transport, with Bingyan Han.
13. A Rank-Based Reward between a Principal and a Field of Agents: Application to Energy Savings, with, Clemence Alasseur, Roxana Dumitrescu, and Quentin Jacquet.

Some other writing

- Review of the two volume book Probabilistic Theory of Mean Field Games with Applications, by René Carmona and François Delarue. July 2019, Bachelier Finance Society Newsletter.
- Why crowds aren't always wise: Lessons from mini-flash crashes on Wall Street, July 2017, Conversation.
- Are the high-rolling quants of horse racing our friends or foes? May 2016, Conversation.
- In memory of Hayri Korezlioglu, Matematik Dunyasi, 2007, Vol III, page 67. (In Turkish)

Teaching Experience

- University of Michigan
  1. Math 626 Stochastic Analysis/Control: Winter 2008, Winter 2009, Winter 2012, Winter 2013, Winter 2015, Winter 2017.
  2. Math 625 (Stat 625), Probability Theory: Winter 2007, Fall 2007, Fall 2008, Fall 2011, Fall 2013, Fall 2014, Fall 2017, Fall 2022, Fall 2024.
  3. Math 623 (IOE 623), Computational Finance: Fall 2004, Winter 2005, Winter 2006, Fall 2006, Fall 2010, Winter 2011, Fall 2015.
  4. Math 573, Financial Math I. Fall 2018, Fall 2023, Fall 2025.
  5. Math 526 (Stat 526), Discrete Time Stochastic Processes, Fall 2008, Fall 2016.
  6. Math 506, Continuous Time Stochastic Analysis for Finance, Fall 2007, Winter 2018, Winter 2020, Winter 2021, Winter 2022, Winter 2023, Winter 2024, Winter 2025, Winter 2026.
  7. Math 423, Introduction to Mathematical Finance: Fall 2005, Winter 2012, Winter 2013.

  Independent Study. The following courses are voluntary, i.e., in addition to my ordinary teaching duties.

8. Math 700, reading course (with Mikhail Fadin, Winter 2022; Jingjie Zhang, Winter 2018; Alex Munk, Winter 2015 and Fall 2015; Zhou Zhou, Fall 2012; Ross Kravitz, Fall 2008; Xueying Hu, Fall 2007.)
9. Math 499, reading course with undergraduate engineering student Aditya Dabas: Winter 2007.
10. Math 399, reading course with exchange sophomore students from an actuarial program in Australia, Fall 2008.

- Princeton University (Teaching Assistant)
  1. Digital Signal Processing, ELE 482, 2001.
  2. The Wireless Revolution: Telecommunications for the 21st Century, ELE 391, 2003.
  3. Introduction to Electrical Signals and Systems, ELE 201, 2000.

Thesis Committee Member of the following students (besides my own students)

1. Hyekyung Min (2007, UM, AIM (Applied and Interdisciplinary Mathematics)).
2. Ou Zhao (2008, UM, Statistics).
3. Ramji Venkataramanan (2008, UM, Electrical Engineering).
4. Matt Linn (2009, UM, Statistics).
5. Bobby Reiner (2010, UM, Statistics).
6. Ali Nazari (2011, UM, Electrical Engineering).
7. Ting Wang (2011, UM, AIM).
8. Jung Hyun Bae (2011, UM, Electrical Engineering).
9. Paul Gassiat (2011, Paris 7 (Diderot), Mathematics).
10. Xiang Yu (2012, University of Texas at Austin, Mathematics).
11. Jingchen Wu (2013, UM, AIM).
12. Vladimir Lubyshev (2015, Rutgers University, Mathematics).
13. Gaoyue Guo (October 2016, Ecole-Polytechnique, Math)
14. Roman Gayduk (May 2017, UM Math).
15. Nicolas Hernandez (June 2017, Paris Dauphine).
16. Jonathan Zouari (February 2021, University of Jerusalem, Stat.).
17. Jodi Dianetti (November 2021, University of Bielefeld, Math.)
18. Mehdi Talbi (September 2022, Ecole-Polytechnique.)
19. Yili Zhang (May 2023, University of Michigan, AIM.)
20. Zhongyuan Cao (September 2023, INRIA and Paris Dauphine.)
21. Ethan Zell (UM Math, May 2024).
22. Chuhao Sun (UM AIM, June 2024).
23. Conrad Kosowsky (UM Econ and Complex Systems, May 2025).

University of Michigan African Presidential Scholar

I hosted Ph.D. student Dennis Ikpe (who graduated from the applied mathematics program from The University of Cape Town in June 2016) for the 2014-2015 academic year. Dr. Ikpe is now a an assistant professor at Michigan State University (a position he took after returning to the math department at UNISA (University of South Africa) as an assistant professor).

Service

- Departmental/University Service
  - **Program director of the Quantitative Finance and Risk Management Masters Program**, January 2015 (inception)-.
  - **Financial/Actuarial Area Leader, Fall 2015-.**
  - Executive Committee of the Math Department, Fall 2023-Summer 2025.
  - Faculty Budget Engagement Committee, 2024-2026.
  - University of Michigan Financial Affairs Advisory Committee (FAAC), 2019-2023.
  - Organizer of the Financial/Actuarial Mathematics Seminar at Michigan
  - Organizer of the Van Eenam Lectures.
  - Financial Mathematics Faculty and Post-doc hiring.
  - Admissions & Fellowships, pure math Fall 2020–
  - Member of the Math/Stat position hiring committee 2010-2011.
  - Representative in the University Senate Assembly, Fall 2011-Spring 2014.
  - AIM Admissions and Fellowships Committee (2007-2009)
  - Masters Committee, Fall 2016-Winter 2021.
  - Consultant, Education and Course Oversight Committee, Fall 2016.
  - Quant MOU Committee Fall 2017.
  - Transfer Credit Evaluation Committee, Fall 2013-Spring 2015.
  - External Liaison Committee (2006–2012).
- Editorial responsibilities are described on the 2nd page.
- Service as a reviewer
  - As a panelist: Served as a member of the NSF (National Science Foundation) DMS Division of Mathematical Sciences panels: AMC-SS (1), Financial Mathematics (3), Control (1).
  - As a adhoc reviewer of grant proposals: NSF CAREER (2), NSF DMS Applied Mathematic (3), NSA (National Security Agency), The Army Research Office, NSERC (Natural Sciences and Engineering Research Council of Canada), SSHRC (Social Sciences and Humanities Research Council of Canada), MITACS (Mathematics of Information Technology and Complex Systems), Swiss National Science Foundation, German-Israeli Foundation for Scientific Research and Development, Research Council of Norway (RCN) Research Grant Council (RGC) of Hong Kong, Summer Course Grant Application to the Croucher Foundation of Hong-Kong, New Researchers Start-up Program proposal of the Fonds Quebecois de la recherche sur la nature et les technologies, and and City University of New York (CUNY) Collaborative Incentive Research Grant, Field Institute's (Toronto, Canada) Thematic and Focus Program, Competitive Research Grants Program (CRG) of KAUST.
  - Wrote a review on the 2 Volume Book (1410 pages) of Carmona and Delarue "Probabilistic analysis of mean field games" for the Bachelier Finance Society.
  - As a reviewer of journal articles: Acta Applicanda Mathematicae, Annals of Applied Probability, Annals of Probability, Communications on Stochastic Analysis, Electronic Communications in Probability, Electronic Journal of Probability, European Journal of Finance, European Journal of Operational Research, IEEE Transactions on Automatic Control, IEEE Transactions on Information Theory, Illinois Journal of Mathematics, Interfaces and Free Boundaries, International Journal of Theoretical and Applied Finance, Journal of Applied Probability, Journal of Banking and Finance, Journal of Economic Dynamics and Control, Journal of the European Mathematical Society, Journal of Mathematical Analysis and Applications, Mathematics and Financial Economics, Management Science, Mathematical Finance, Mathematical Methods of Operations Research, Mathematical Reviews, Mathematics of Operations Research, Memoirs of the

AMS, Michigan Mathematical Journal, North American Actuarial Journal, Operations Research, Operations Research Letters, Probability Theory and Related Fields, Proceedings of AMS, Quantitative Finance, SIAM Journal on Control and Optimization, SIAM Journal on Financial Mathematics, SIAM Journal on Multi-scale Modeling and Simulation, Stochastic Processes and Their Applications, Systems and Control Letters.

- *Risks* guest editor [of "Application of Stochastic Processes in Insurance" Special Issue, submission deadline October 2013].
- Nominations for the Fudan-Zhongzhi Science Award 2021.

- Service as a conference organizer.

  1. Organizer ((with Asaf Cohen and Ibrahim Ekren)) of Byrne B2A2 Workshop, June 2025.
  2. Organizer of the annual Van Eenam Lectures (2018-). Speakers: Nizar Touzi, Walter Schachermayer, Ioannis Karatzas, Huyen Pham, Thaleia Zariphopoulou, Mete Soner, Rene Carmona.
  3. Organizer (with Asaf Cohen and Ibrahim Ekren) of the Byrne Conference on Stochastic Analysis in Finance and Insurance, University of Michigan, June 2024.
  4. Organizer (with Sergey Nadtochiy) of the Byrne Workshop on Stochastic Analysis in Finance and Insurance, University of Michigan, May 2018. Total budget: $50,000.
  5. Organizer (with Romuald Elie, Johannes Muhle-Karbe and Sergey Nadtochiy) of the Byrne Young Researcher Workshop on Mathematical Finance, to be held in Ann Arbor, March 27-31 2017: $40,000.
  6. Organizer (with Johannes Muhle-Karbe and Sergey Nadtochiy) of the Byrne Workshop on Stochastic Analysis in Finance and Insurance, University of Michigan, June 2016. Total budget: $75,000.
  7. Organizer (with Mihai Sirbu and Gordan Zitkovic) of the Workshop on Stochastic Analysis in Finance and Insurance, University of Michigan, May 2011 (17-20). Total budget: $60,000.
  8. Co-organizer of the Workshop on Financial Engineering for Actuarial Mathematics, May 2007, Ann Arbor, Michigan.

- Organization role at conferences/societies

  1. Scientific Committee of the 13th World Congress of the Bachelier Finance Society, in Bologna, Italy, June 29 - July 3, 2026.
  2. Co-organizer of "Stochastic Control Theory and Applications" at the upcoming 2025 SIAM Conference on Control Theory and its Applications (CT25) -which also takes place concurrently with the Joint SIAM/CAIMS Annual Meeting (AN25)- in Montréal, Québec, Canada, on July 28–30, 2025.
  3. Co-organizer of "Mean Field Games and Related Topics" session at the AMS-UMI meeting, July 23-26, 2024, Palermo, Italy.
  4. Scientific Committee of the (bi-annual) SIAM Conference on Financial Mathematics & Engineering, Virtual, June 1-4, 2021.
  5. Scientific Committee of the (bi-annual) AMaMeF (Advanced Mathematical Methods in Finance) Padova (Italy). Tuesday, June 22, 2021-Friday, June 25, 2021.
  6. Turkish Mathematical Society Colloquium Committee, April 2021-.
  7. Scientific Committee of the 10th World Congress of the Bachelier Finance Society, Dublin, Ireland, July 16-20, 2018.
  8. Scientific Committee of the National Mathematical Congress of Turkey, 2017.
  9. SIAG/FME Nominating Committee for spealers, 2016.
  10. Organizing/Scientific Committee Member of the SIAM Conference on Financial Mathematics & Engineering (FM14) to be held in Chicago, November 13-15, 2014
  11. Member of the committee for SIAG/FME Early Career Prize, 2014.

12. Organizer of the mini-symposiums in the SIAM Conference on Financial Mathematics and Engineering in 2012 (Minneapolis), 2010 (San Francisco), 2008 (Rutgers), 2006 (Boston).
13. Member of the Scientific Committee of the Rutgers Mathematical Finance and Partial Differential Equations Conference, December 2009 & 2011.
14. Organizer (along with Tim Leung and Birgit Rudlof) of the 3 Special Sessions on Financial Mathematics at the AMS Annual Meeting in 2009.
15. Organizer of the Finance and Stochastics session at the annual INFORMS meetings in 2009 (San Diego), in 2006 (Pittsburgh), and in 2005 (San Fransisco).
16. Organizer of the Finance and Stochastics Session for the Informs International Conference in 2007 (Puerto-Rico).

Research Visits and Talks

2025

1. 2025 SIAM Conference on Control Theory and its Applications (CT25) , Joint SIAM/CAIMS Annual Meeting (AN25), Montréal, Québec, Canada, July 28–30, 2025.
2. SIAM Conference on Financial Mathematics and Engineering (FM25), July 15-18, Miami.
3. A conference in honor of René Carmona, CIRM, Marseille, France, May 19- 23, 2025. (had to cancel).
4. "Advances in Stochastic Control and Reinforcement Learning" on April 27 - May 2, 2025, BIRS, Banff, Canada.
5. Princeton ORFE Colloquium, April 1.
6. Columbia-NYU Financial Engineering Colloquium, February 5, 2025.

2024

1. One hour lecture at 2024 Midwest Probability Colloquium, October 10-12, 2024, Northwestern University.
2. Special session: Mean Field Games and Related Topics, at the 2nd International Joint Meeting co-organized by the Unione Matematica Italiana and the American Mathematical Society, July 23-26.
3. BIRS-UBC-O Workshop, "New Trends and Challenges in Stochastic Differential Games" on June 23 - 28, 2024, at the Okanagan campus of the University of British Columbia.

2023

1. Finance seminar at Boston University's Questrom School of Business, Dec. 8.
2. Stochastic Control and Financial Engineering, Princeton, June 20-23, 2023.
3. Mean Field Models Minisymposia, SIAM FME 2023 annual meeting, June 6–9, Philadelphia.
4. Conference on "Stochastic Analysis and Financial Mathematics at Illinois Tech", May 18-20.
5. Workshop on "Stochastic Modeling and Control" to be held in the Mathematical Research and Conference Center in Bedlewo (near Poznan), Poland on May 8-13th.
6. Distributed Solutions to Complex Societal Problems Reunion Workshop, University of Chicago, Feb 20-24.

2022

1. Peter Carr Gedekschrift, Nov 11-12, University of Maryland.
2. Plenary Speaker, 6th Eastern Conference in Math-Finance at Rutgers, Oct 14-16.
3. Stochastic Control and Quantitative Finance, Jerusalem, September 12-14, 2022.
4. "Taming Uncertainty and Complexity in Economics and Finance", Luiss University (Rome, Italy), May 26-28.
5. Waterloo University, Seminar Series in Actuarial Science and Financial Mathematics, May 6. (Virtual)

2021

1. Distributed Solutions to Complex Societal Problems program, workshop on Applications to Financial Engineering, Dec 6-8, at the Institute for Mathematical and Statistical Innovation (IMSI) in Chicago. Hybrid.
2. Control and optimization seminar, Imperial College, Nov 10, virtual.
3. Mean Field Games on Networks from October 26, 2021, to October 29, 2021, at the PIMS, University of British Columbia, Vancouver, hybrid.
4. Columbia University, Math Finance Seminar, Oct 14, virtual.
5. Advances in Stochastic Analysis for Handling Risks in Finance and Insurance" at the CIRM in Luminy (near Marseille); September 13-17, 2021; hybrid.
6. One world Optimal Stopping Seminar, July 14. Virtual.
7. Invited speaker at Statistical Methods in Finance is a series of conferences and workshops jointly organized by Chennai Mathematical Institute, June 28-July 2. Virtual.
8. Summer School on Distributed Control: Decentralization and Incentives at CIRM, Marseilles, France from June 14 to 18. Virtual.
9. METU, Ankara Applied Math Colloquium, May 18. Virtual.
10. Warwick Department of Statistics Colloquium, Wed. April 28. Virtual.

2020, Year of COVID-19 and many cancellations.

1. Mean-Field Games , University of Chicago, conference organized by Pierre-Louis Lions, Pierre Cardaliaguet and Takis Souganidis, Feb 5-8.

2019

1. Computational and Applied Mathematics / PDE Colloquium, University of Chicago, December 4.
2. UCSB CFMAR (Center for Mathematical Finance and Actuarial Research) seminar, November 18.
3. **Advances in Stochastic Analysis for Handling Risks in Finance and Insurance" at the CIRM in Luminy (near Marseille), October 21-25.**
4. **"Mean-Field Games and Related Topics - 5, September 9-13, 2019,CIRM (Centro Internazionale per la Ricerca Matematica).**
5. **Plenary speaker at the 9th General AMaMeF Conference is organized by LPSM at Sorbonne University and Paris Diderot, LaMME at Evry University and ENSIIE. Paris, June 11-14.**
6. Second Leeds Meeting on Stochastic Control and Games under Ambiguity, April 8-13.

7. Joint Stochastic Analysis and Math Finance Colloquium of Humboldt and TU Berlin, Jan 31.

2018

1. Invited talk at the 10th Bachelier Conress, July 16-19.
2. Visiting Professor Umut Cetin LSE, London, July 9-15, July 20.
3. Plenary speaker at Symposium on Optimal Stopping in Honor of Larry Shepp, June 25-29, Rice University in Houston, Texas, USA.
4. Plenary speaker at **METE - Mathematics and Economics: Trends and Explorations) June 4-8 at the Forschungsinstitut Mathematik (FIM) of ETH Zurich.**

2017

1. Plenary speaker at **Workshop "Advances in Stochastic Analysis for Risk Modeling", CIRM (France)**, Nov 13-17.
2. Minisyposium on Stochastic Control and Applications organized by George Yin and Jionming Yong at the SIAM Conference on Control and Applications CT17, July 10-12 at Pittsburgh.
3. Robust Methods in Probability & Finance, ICERM, Brown University, June 19-23.
4. Financial Math Seminar, Dipartimento di Economia e Finanza LUISS, Rome, May 19.
5. **De Finetti Risk Seminar in Milano, May 17.**
6. Probability and Mathematical Finance Seminar, Carnegie Mellon, Department of Mathematical Sciences, May 1.
7. Fields Institute Quantitative Finance Seminar series, April 26.
8. Invited lecture at the 16th Winter School on mathematical finance, Netherlands, January 23-25.

2016

1. Invited Mini-symposium speaker in "Robust, model free and semi-parametric methods in math finance" organized by Matt Lorig, November 17-19. SIAM Conference on Financial Mathematics, Austin, TX.
2. **Plenary speaker at the 9th World Congress of the Bachelier Finance Society, NYC, July 15-19.**
3. **HVP65–A workshop honoring Vince Poor**, Barcelona, July 9th.
4. Mathematical Finance, Risk and Uncertainty, a joint seminar series created by the Departments of Math, Finance and Industrial Engineering, UIUC, May 9th.
5. Invited speaker at the Risk and Stochastic Conference, London School of Economics, April 21-22.
6. Invited speaker at the Eastern Conference on Mathematical Finance held on March 18-20, 2016 at Worcester Polytechnic Institute.

2015

1. **ORFE Colloquium, Princeton University, October 6.**
2. **Colloquium, H. Milton Stewart School of Industrial and Systems Engineering at Georgia Tech, September 16.**
3. Invited speaker in the Stochastic Control Session at the AMS Sectional Meeting at Michigan State University in East Lansing, Michigan, March 14-15, 2015
4. Invited speaker at "Paris - Southeast Asia Conference in Mathematical Finance", February 7-11, Siam Reap, Cambodia.
5. **Plenary speaker at NUS-University of Paris Diderot Workshop on Quantitative Finance**, 4-5 February 2015, at the National University of Singapore.

2014

1. **Boeing Distinguished Colloquium, University of Washington, Nov 20.**
2. Invited mini-syposium speaker at the SIAM Conference on Financial Mathematics and Engineering (FM14), Nov 13-15.
3. Conference at the University of Chicago, Trading and Portfolio Strategies, November 11-12. (Plenary speaker.)
4. **Financial Mathematics Seminar, Princeton University, September 11.**
5. **Invited speaker in the workshop entitled New Directions in Financial Mathematics and Mathematical Economics at the Banff International Research Station (BIRS), in Alberta, Canada, July 6-11 (by invitation only event).**
6. Visited Professor Huyên Pham (Paris 7), June 8-24.
7. **Plenary talk at Labex Louis Bachelier - SIAM-SMAI Conference** on Financial Mathematics: Advanced Modeling and Numerical Methods, June 17-20, 2014, Paris.
8. Colloquium of ISFA (Institut de Science Financiere et d'Assurances), University of Lyon 1, June 4. (Visited Professor Setfan Loisel June 1-8.)
9. Mathematical Finance colloquium, Dublin City University, May 28. (Visited Professor Paolo Guasoni May 17-June 1).
10. **Oberwolfach workshop** on Stochastic Analysis in Finance and Insurance, May 4-10 (by invitation only event).
11. **Columbia Mathematical Finance Seminar**, March 6.

2013

1. Invited speaker at the Isaac Newton Institute in Cambridge, UK "Mathematical and Physical Sciences of Modern Financial Markets: Computerised Trading at Low and High Frequency", 19-21 November 2013, (by invitation only event).
2. One week visit to Université du Maine (Laboratoire Manceau de Mathématiques), Le Mans, France, Oct 6-12, 2013. (Gave a talk in the probability and statistics seminar.)
3. Financial Mathematics Seminar, University of Pittsburgh , Feb 11, 2013.

2012

1. Mathematics Colloquium, WPI, Dec. 7.
2. Statistics and Probability Seminar, Department of Mathematics and Statistics, Boston University, Dec. 6.
3. 2012 Algorithm Workshop (organized by NSF), November 26th-29th in San Diego, CA.
4. Visiting ETH (Professor Mete Soner), November 5-8 and gave the financial mathematics colloquium.
5. **International Conference on Advanced Stochastic Optimization Problems organized by the Steklov Institute of Math, Moscow, September 24-28, plenary speaker.**
6. USC Mathematical Finance Colloquium, Sep. 17.
7. SIAM Conference on Financial Mathematics and Engineering, July 9-11. Invited speaker in the mini symposium entitled "Stochastic Control in Finance".
8. **Probability, Control and Finance:A Conference in Honor of the 60th Birthday of Ioannis Karatzas, June 4-8, 2012, NYC, plenary speaker.**
9. Mathematical Finance Seminar, University of Evry, Dept. of Math, May 31, 2012, France. (Visited University of Evry May 17-June 1.)
10. Financial Mathematics Seminar, ETH, Zurich, May 10. (Visited ETH, FIM (Institute for Mathematical Research) May 2-17.)
11. Finance and Stochastics Seminar, Imperial College, Department of Mathematics, March 14, 2012.

12. Actuarial and Financial Mathematics Conference, Brussels, February 9-12, 2012, plenary speaker.

2011

1. University of Minnesota, Mathematics Colloquium, Dec 1, 2011.
2. Liquidity Risk Modeling workshop organized by the University of Evry, Nov 18-19, 2011, Paris.
3. Mathematical Finance Seminar, University of Evry, Nov. 17, 2011.
4. University of Sydney, School of Mathematics Colloquium, Nov 4.
5. Mathematical Finance Colloquium, USC, October 17.
6. Mathematics Colloquium, Rutgers University, September 16.
7. Economics Colloquium, Rutgers University, September 15.
8. International Conference on Mathematical Finance and Economics, Istanbul, July 6-8 (Plenary speaker).
9. The 35th Conference on Stochastic Processes and their Applications, Oaxaca, Mexico, June 19-24. (Invited speaker.)
10. The 6th Symposium on BSDEs and Applications, the University of Southern California (USC), June 8-10, 2011. (Invited Speaker)
11. Advances in Portfolio Theory and Investment Management, Oxford-Man Institute, University of Oxford, May 12, 13 and 14. (Keynote speaker).
12. Risk & Stochastics Seminar, London School of Economics, May 11, 2011.
13. Bachelier Seminar, l'Institut Henri Poincare, Paris, May 6th (& visiting Professor Huyên Pham at University of Paris 7 (Diderot) for a week).
14. Mathematical Finance Seminar, Paris 6 and 7, France, May 5.
15. Mathematics Colloquium, Wayne State University, April 18.
16. Inaugural lecture for the Susan M. Smith Chair, University of Michigan, March 22.
17. Cornell ORIE Colloquium, January 25.

2010

1. Mathematical Finance and Partial Differential Equations Conference 2010 at Rutgers University (Keynote Speaker).
2. Math Colloquium, Ohio State University (December 3rd).
3. SIAM Conference on Financial Mathematics and Engineering (FM10) November 19-20, 2010, San Francisco, plenary speaker and organizer of a session on optimal stopping.
4. Risk Seminar, Joint seminar of Columbia Statistics and CUNY Graduate Center Math. Nov 5, 2010.
5. Bachelier Finance Society World Congress, Fields Institute, Toronto, June 22-26, 2010 (Invited speaker in the Stochastic Control Theme).
6. IMA Workshop, New Mathematical Models in Economics and Finance, June 9-18.
7. 6th Conference in Actuarial Science & Finance on Samos, June 3-6, 2010 (keynote speaker).
8. Financial Mathematics Seminar, University of Texas at Austin, April 23, 2010.
9. Western Michigan University, Mathematics Colloquium, March 18, 2010.
10. Montreal Seminar of Actuarial and Financial Mathematics, March 12, 2010.
11. Center for Research in Financial Mathematics and Statistics (seminar), UCSB, February 22, 2010.

2009

1. Cornell University, Department of Mathematics, Probability Seminar, Oct 19th, 2009.

2. INFORMS Annual Meeting, San Diego, Oct. 11-14, 2009 (invited speaker to the Finance and Stochastics and Portfolio Credit Risk Sessions).
3. Rutgers University, Mathematical Finance and Probability Seminar, September 29, 2009.
4. Department of Risk Management and Insurance, Georgia State University, Quantitative Finance Seminar, August 28, 2009.
5. Stanford University, Department of Mathematics, Financial Mathematics Seminar, April 24, 2009.
6. Fields Institute Quantitative Finance Seminar (also visited McMaster University), April 2, 2009.
7. What is seminar, University of Michigan, March 24, 2009.
8. University of Southern California, Dept. of Mathematics, Mathematical Finance Colloquium. Feb 23, 2009.
9. Princeton University, Stochastic Analysis Seminar, 16th and 18th of February, 2009.
10. AMS Annual Meeting, Special Session on Financial Mathematics, Washington D.C., Jan. 7-8, 2009 (invited speaker).

2008

1. SIAM Conference on Financial Mathematics and Engineering, Rutgers, November 21-22, 2008 (invited speaker).
2. Probability Seminar, Columbia University, Department of Mathematics, November 14, 2008.
3. IFID/MITACS Conference on Financial Engineering for Actuarial Mathematics, Fields Institute, Toronto, November 9-10, 2008 (keynote speaker).
4. Workshop on Optimization and Optimal Control, Linz, Austria, October 20-24 2008.
5. Mathematics Seminar, Istanbul Center for Mathematical Sciences, May 2008.
6. Workshop in Memory of Professor Hayri Korezlioglu, Ankara, Turkey, April 2008 (keynote speaker).
7. Daiwa Young ResearchersÕ International Workshop, Kyoto University, March 2008 (keynote speaker).
8. Oberwolfach Workshop on Stochastic Analysis in Finance and Insurance, Germany, January 2008 (by invitation only event).
9. Annual AMS Meeting, San Diego, 2008 (invited speaker for the financial mathematics special session).

2007:

1. Fields Institute, Actuarial Science and Mathematical Finance Seminar, Toronto, November 2007.
2. Mathematics Colloquium, Illinois Institute of Technology, Chicago, November 2007.
3. Mathematics Colloquium, University of Texas at Austin, October 12, 2007.
4. The Fourth IASTED International Conference on Financial Engineering and Applications, Berkeley, CA, September 24-26, 2007 (invited speker).
5. The 32nd Conference on Stochastic Processes and their Applications, Urbana-Champaign, August 2007 (invited speaker).
6. INFORMS International, Puerto Rico, July 2007 (invited speaker).
7. Kent-Purdue Minisyposium on Financial Mathematics, April 27-28, 2007 (invited speaker).
8. Statistics Colloquium, University of Michigan, March 23, 2007.
9. Syracuse UniversityÕs Business School, Finance Colloquium, March 2, 2007.
10. Mathematics Colloquium, Bowling Green State University, February 23, 2007.

11. Financial Engineering Seminar, University of Florida, Dept. of Industrial Engineering, February 9, 2006.
12. Probability Seminar, Mathematical Sciences, Carnegie Mellon University, January 15, 2007
13. Annual AMS Meeting, January 5-8, 2007 (invited speaker).

2006:

1. Probability Seminar, Columbia University, Department of Mathematics, Dec. 15 2006.
2. Probability and Mathematical Finance Seminar, Carnegie Mellon University, Department of Mathematical Sciences, November 20, 2006.
3. Informs Annual Meeting, Pittsburgh, November 5-8, 2005 (invited speaker for the Financial Engineering Session).
4. SIAM Conference on Financial Mathematics and Engineering, July 9-12, Boston, invited speaker.
5. 21st European Conference on Operations Research in Reykjavik, Iceland, July 2-5 (invited speaker).
6. Operations Management Colloquium, University of Michigan, Stephen M. Ross School of Business, March 3, 2006.
7. Industrial Engineering and Operations Research Colloquium, University of California at Berkeley, Feb 24, 2006.
8. Industrial Engineering and Operations Research Colloquium, Columbia University, Feb 22, 2006.
9. Statistics Colloquium, University of California at Berkeley, February 7, 2006.
10. Mathematics Colloquium, Illinois Institute of Technology, Janury 30, 2006.
11. Statistics and Operations Research Colloquium, University of North Carolina at Chapel Hill, January 27, 2006.
12. Industrial Engineering Colloquium, Industrial and Enterprise Systems Engineering, University of Illlinois at Urbana Champaign, January 23, 2006.
13. Applied Probability and Statistics Colloquium, University of California at Santa Barbara, January 20, 2006.

2005:

1. IEEE Conference on Decision and Control; European Control Conference ECC 2005, Seville, December 12-15 (invited speaker).
2. Industrial Engineering Special Seminar, Purdue University, December 6, 2005.
3. Informs Annual Meeting, San Fransisco, November 13-16, 2005 (invited speaker for the Financial Engineering Session).
4. Financial/ Actuarial Mathematics Seminar, University of Michigan, Dept. of Mathematics, September 15, 2005.
5. 43th Annual Allerton Conference on Communication, Control, and Computing, Allerton, Illinois, September 28-30, 2005.
6. CMS Summer Meeting, Waterloo, CA, June, 2005 (invited speaker to the Mathematics of Actuarial Finance session).
7. Stochastic Analysis Seminar, Princeton University, March 30, 2005.
8. Financial/ Actuarial Mathematics Seminar, University of Michigan, Dept. of Mathematics, February 17, 2005.

2004:

1. Financial/ Actuarial Mathematics Seminar, University of Michigan, Dept. of Mathematics, November 4, 2004.
2. Informs Annual Meeting, Denver, October 24-27, 2004 (invited speaker for the Financial Engineering Session).

3. Third World Congress of the Bachelier Finance Society, Chicago, July 21-24, 2004.
4. 38th Annual Conference on Information Sciences and Systems, Princeton, March 2004.
5. Industrial and Systems Engineering Graduate Seminar, University of Florida, Dept. of Industrial Engineering, February 12, 2004.
6. Mathematics Colloquium, Florida State University, Dept. of Mathematics, Feb 02, 2004.

2003:

1. Fractional Brownian Days, Helsinki, Finland, September 26-27, 2003.
2. 29th Conference on Stochastic Processes and Their Applications, Angra dos Reis, Brazil, August 3 - 9, 2003.
3. Euro Informs Joint International Meeting, Istanbul,Turkey, July 6-10, 2003;
4. Eighth Viennese Workshop on Optimal Control, Dynamic Games and Nonlinear Dynamics, Vienna,May 14-16, 2003.

Collaborators

1. Clemence Alasseur (Researcher, EDF Lab Saclay)
2. Guillermo Alonso Alvarez (my post-doc)
3. Hamed Amini, (Associate Professor, Department of Industrial Engineering, University of Florida.)
4. Bahman Angoshtari (Assistant Professor University of Miami, Department of Mathematics; my former post-doc,)
5. Parsiad Azimzadeh (PDT Partners, NYC; My former Post-doc.).
6. Nicole Bäuerle (Professor, Karlsruhe Institute of Technology, Department of Mathematics).
7. Christoph Knochenhauer (Assistant Professor, Technical University of Munich, Department of Mathematics)
8. Thomas Bernhardt (Lecturer (Assistant Professor at the University of Manchester; my former Post-doc).
9. Amarjit Budhiraja (Professor, Department of Statistics, University of North Carolina at Chapel Hill).
10. Matteo Burzoni (Quant, Credit Suisse, Zurich.)
11. Thomas Caye (Quant at SIG Dublin..)
12. Alekos Cecchin (Assistant Professor, University of Padova.)
13. Prakash Chakraborty (Assistant Professor, The Pennsylvania State University, Department of Industrial and Manufacturing Engineering).
14. Suman Chakraborty (ABN Amro Bank, Amsterdam; my former Post-doc).
15. Li Chen (Retired. Former Executive Director, JPMorgan Chase).
16. Tao Chen (Quant at QRM; my former post-doc)
17. Hang Cheung (Ph.D. student at the University of Calgary)
18. Sören Christensen (Professor, University of Kiel, Department of Mathematics)
19. Asaf Cohen (Associate Professor at the University of Michigan, Department of Mathematics; my former post-doc).
20. Andrea Cosso (Professor at the University of Milan, Italy).
21. Alexander Cox (Professor of Probability, University of Bath, Britain.)
22. Jaksa Cvitanic (Richard N. Merkin Professor of Mathematical Finance, Caltech.)
23. Christoph Czichowsky (Associate Professor, Mathematics, LSE.)
24. Purba Das (Lecturer at King's College, London, my former post-doc.)

25. Savas Dayanik (Professor, Bilkent University (in Ankara, Turkey), Department of Industrial Engineering).
26. Francois Delarue (Professor of Mathematics, Universite Nice-Sophia Antipolis, France.)
27. Shuoqing Deng (Tenure Track Assistant Professor at the Hong-Kong University of Science and Technology, my former post-doc).
28. Leonid Dolinskyi (Assistant Professor, The University of State Fiscal Service, Department of Economic Cybernetics, Ukraine.)
29. Yan Dolinsky (Professor, Hebrew University of Jerusalem, Department of Statistics).
30. Roxana Dumitrescu (Senior Lecturer, King's College London, Department of Mathematics).
31. Stephan Eckstein (Junior professor in the math department at the University of Tübingen.)
32. Masahiko Egami (Professor, Kyoto University, Graduate School of Economics; Former post-doc, University of Michigan, 2005-2007).
33. Tom Emmerling (Senior Quantitative Risk Analyst at M&T Bank Corporation; my former post-doc.)
34. Ibrahim Ekren (Associate Professor, Department of Mathematics, University of Michigan; my former post-doc.)
35. Erik Ekström (Professor, Uppsala University, Department of Mathematics.)
36. Arash Fahim (Associate Professor; Department of Mathematics, Florida State University; my former post-doc.)
37. Georgios Fellouris (Associate Professor; Department of Statistics, University of Illinois at Urbana-Champign.)
38. Qi Feng (Assistant Professor at Florida State University, my former post-doc).
39. Jun Geng (Associate Professor at Harbin Institute of Technology, China.)
40. Gaoyue Guo (Assistant professor at Paris-Saclay, my former Post-doc).
41. Jia Guo (Risk Strategy Expert, JD Technology, my former Ph.D. student).
42. Bingyan Han (Assistant Professor at Hong Kong University of Science and Technology (Guangzhou). , my former post-doc).
43. Xihao He (my post-doc).
44. Ulrich Horst (Professor, Humboldt University of Berlin, Department of Mathematics.)
45. Xueying Hu (Vice President, Market risk modeling, Goldman Sachs; my former Ph.D student.)
46. Liwei Huang (Ibrahim Ekren's Ph.D. student).
47. Yu-Jui Huang (Tenure track Assistant Professor at the Department of Applied Mathematics, University of Colorado-Boulder; my former student.)
48. Quentin Jacquet (Researcher, EDF Saclay)
49. Ali Kara (Tenure track Assistant Professor at Florida State University, Department of Mathematics, my former post-doc).
50. Ioannis Karatzas (Eugene Higgins Professor of Applied Probability, Columbia University, Department of Mathematics).
51. Kostas Kardaras (Professor, London School of Economics, Department of Statistics).
52. Christian Keller (Tenure Track Assistant Professor, University of Central Florida; my former post-doc).
53. Donghan Kim (Tenure Track Assistant Professor at KAIST, Seoul, my former post-doc).
54. Nikolaos Kolliopoulos (my post-doc).
55. Ross Kravitz (Senior Data Scientist at Stripe; my former Ph.D. student.)
56. Andreas Kyprianou (Professor of Statistics, Warwick.)
57. George Labahn (Professor of Computer Science, University of Waterloo).

58. Lifeng Lai (Professor, Electrical and Computer Engineering, UC Davis).
59. Fei Lu (Associate Professor, Department of Mathematics, Johns Hopkins University).
60. Jiaqi Li (Equity Derivatives Quant at CLSA, my former Ph.D. student).
61. Wuchen Li (Assistant Professor, University of South Carolina).
62. Zhibin Liang (Professor, School of Mathematical Sciences, Nanjing Normal University, China).
63. Mike Ludkovski (Professor, University of California at Santa Barbara, Department of Applied Probability and Statistics; Former post-doc, University of Michigan, 2005-2008).
64. Mauro Maggioni (Bloomberg Distinguished Professor, Johns Hopkins University.)
65. Jose-Luis Menaldi (Professor, Wayne State University, Department of Mathematics).
66. Moshe Milevsky (Professor, York University (Canada), Schulich School of Business).
67. Christopher W. Miller (Associate @ Goldman Sachs.)
68. Indrajit Mitra (Economist at Federal Reserve Bank of Atlanta)
69. Kristen Moore (Associate Professor, University of Michigan, Department of Mathematics).
70. Alexander Munk (Quant/Financial Engineer at Chicago Trading Company, my former Ph.D. student).
71. Sergey Nadtochiy (Associate Professor, Illinois Institute of Technology.).
72. April Nellis (My Ph.D. student).
73. Dominykas Norgilas (Assistant Professor, North Carolina State University, my former post-doc).
74. Mikko Pakkanen (Associate Professor, Department of Statistics and Actuarial Science, University of Waterloo).
75. Huyên Pham (Professor, Ecole Poyltechnique).
76. H. Vincent Poor (Michael Henry Strater University Professor of Electrical Electrical Engineering, Princeton University, School of Engineering and Applied Science; U.S. National Academy of Sciences; National Academy of Engineering (NAE); a Fellow of the American Academy of Arts & Sciences; My Ph.D Advisor).
77. David Promislow (Emeritus Professor, York University (Canada), Department of Mathematics and Statistics).
78. Jinniao Qiu (Asociate Professor, University of Calgary, Department of Mathematics and Statistics; my former post-doc).
79. Raghuveer Rao (Army Research Lab).
80. Hasanjan Sayit (Associate Professor, Department of Mathematics, Xi'an Jiaotong-Liverpool University).
81. Frank Seifried (Professor, University of Trier, Department of Mathematics).
82. Semih Sezer (Associate Professor, Sabanci University (in Istanbul), Industrial Engineering; Former post-doc, University of Michigan, 2006-2008).
83. Mihai Sîrbu (Professor, University of Texas at Austin, Department of Mathematics).
84. Ronnie Sircar (Professor, Princeton University, Department of Operations Research and Financial Engineering).
85. Qingshuo Song (Associate Professor, WPI, Department of Mathematical Sciences ; my former post-doc).
86. Yavor Stoev (JP Morgan London, former post-doc, Department of Mathematics, University of Michigan.)
87. Ho Man Tai (Post-doc at Dublin City University).
88. Wenpin Tang (Assistant Professor, Columbia University, IEOR.)

89. Abhishek Tilva (Ph.D. student, Columbia University, Statistics.)
90. Gu Wang (Associate Professor WPI, Department of Mathematical Sciences; my former post-doc).
91. Zhenhua Wang (Iowa State University, my former post-doc).
92. Ruoyu Wu (Tenure track-assistant professor at Iowa State University, Department of Mathematics; my former Post-doc).
93. Hao Xing (Associate Professor Boston University, Questrom School of Business; Formerly, Full Professor, London School of Economics, Department of Statistics; my former Ph.D. student).
94. Kazutoshi Yamazaki (Senior Lecturer, The School of Mathematics and Physics, The University of Queensland, Australia).
95. Bo Yang (Executive director, CVA (Counterparty Valuation Adjustment) desk strategiest, Morgan Stanley; my former Ph.D. student).
96. Jie Yang, (Professor, University of Illinois at Chicago, Department of Mathematics).
97. Sichen Yang (Ph.D. Student, Johns Hopkins University).
98. Song Yao (Associate Professor, Pittsburgh University, Department of Mathematics; my former post-doc, University of Michigan, Department of Mathematics).
99. Virginia R. Young (Nesbitt Professor, University of Michigan, Department of Mathematics).
100. Xiang Yu (Associate professor, The Hong Kong Polytechnic University, Department of Applied Mathematics; my former post-doc).
101. Serdar Yuksel (Professor, Queen'a University, Department of Mathematics and Statistics).
102. Jinjie Zhang (Assistant Professor, the School of Banking and Finance at the University of International Business and Economics, my former Ph.D. student).
103. Xin Zhang (Post-doc, University of Vienna, Department of Mathematics, my former Ph.D. student).
104. Yili Zhang (Former Ph.D. student at the University of Michigan).
105. Yuchong Zhang (Quant at Optiver; Former Tenure track assistant professor at the Department of Statistics at the University of Toronto; my former Ph.D. student.)
106. Yuming (Paul) Zhang (Assistant Professor at Department of Mathematics and Statistics, Auburn University.).
107. Zhaoyu Zhang (Post-doc, Department of Mathematics, UCLA).
108. Hongyi Zhou (my Ph.D. student).
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