

Alexander Roitershtein

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Education

- Ph.D. Applied Mathematics, Technion, Haifa, 2004.
- M.Sc. Applied Mathematics, Technion, Haifa, 1999.
- MBA, Decisions and Operations Research, Tel Aviv University, 1996.

Fields of Interest

Probability theory and its applications, stochastic processes.

Academic Positions

- Assistant Professor of Mathematics, Iowa State University, Fall 09-
- Post-Doc, Department of Mathematics, Iowa State University, Fall 07-Spring 09.
- Post-Doc, Department of Mathematics, University of British Columbia, Spring 05-Spring 07.
- Visiting Researcher, ETH, Zurich, Institute for Mathematical Research, Fall 04.

Teaching Experience

- MATH 165 (ISU) Calculus I, Fall 07 and Fall 09.
- MATH 265 (ISU) Calculus III, Fall 08, Fall 11.
- MATH 266 (ISU) Elementary differential equations, Spring 08.
- MATH 267 (ISU) Elementary Differential Equations and Laplace Transforms, Summer 08.
- MATH 268 (ISU) Laplace transforms, Spring 09.
- MATH 307 (ISU) Matrices and Linear Algebra, Summer 08 and Fall 10.
- MATH 317 (ISU) Theory of Linear Algebra, Fall 11.
- MATH 385 (ISU) Introduction to Partial Differential Equations, Fall 10, Summer 11.
- MATH 435 (ISU) 3.0 credit independent studies (Geometry I, Morteza Khosravi), Summer 11.
- MATH 436 (ISU) 3.0 credit independent studies (Geometry II, Morteza Khosravi), Summer 11.

MATH 490 (ISU) 1.0 credit independent studies (undergraduate, Vivek Hirpara), Summer 09.
MATH 490 (ISU) 3.0 credit independent studies (undergraduate, Daehwan Kim), Fall 09.
MATH 490 (ISU) 3.0 credit independent studies (undergraduate, Vivek Hirpara), Spring 11.
MATH 490 (ISU) 3.0 credit independent studies (Calculus II, Morteza Khosravi), Fall 11.
MATH 491 (ISU) 3.0 credit Undergraduate Thesis (Zheng Zhong), Spring 11.
MATH 491 (ISU) 3.0 credit Undergraduate Thesis (Chen Hua), Fall 11.
MATH 492 (ISU) Undergraduate seminar (Game Theory), Spring 09.
MATH 492 (ISU) 2.0 credit independent studies (undergraduate seminar, Jisha Zheng), Fall 10.
MATH 501 (ISU) Introduction to Real Analysis, Summer 11.
MATH 554 (ISU) Introduction to Stochastic Processes, Fall 08 and Fall 09.
MATH 590 (ISU) 1.0 credit independent studies (graduate, Adil Kaymaz), Spring 09.
MATH 610 (ISU) Graduate research seminar, Spring 12.
MATH 645 (ISU) Advanced stochastic processes, Spring 08.
MATH 317 (UBC) Calculus IV, Fall 05 and Fall 06.
MATH 340 (UBC) Introduction to Linear Programming, Summer 07.

Pending Support

NSF Math Biology Grant (PI \$305,980), jointly with A. Matzavinos.

Graduate students

Reza Rastegar (PhD), 2009–2012 (expected); joint with Arka P. Ghosh.
Thesis: "Topics on self-interacting random walks" (tentatively).
Visiting Assistant Professor (Postdoc), University of Connecticut, starting at Fall 2012.

Youngsoo Seol (PhD), 2010–; joint with Anastasios Matzavinos.

Shu Yang (PhD), 2011–; joint with Zhengyuan Zhu.

Subhomoy Ghosh (PhD), 2011–; joint with Arka P. Ghosh.

Zheng Zhong (MSc), 2012–; joint with Arka P. Ghosh,

Wenjun Qin (MSc, 2011), joint with Arka P. Ghosh,
Thesis: "Discrete Ornstein-Uhlenbeck process in a stationary dynamic environment".

Undergraduate Student Projects

Mentor in REU projects

1. Iowa State University, Summer 09 [joint with Arka P. Ghosh and Reza Rastegar (TA)].
Stochastic difference equations.
The results were presented in 2009 Young Mathematician Conference in Ohio State University and in 2009 MATHFEST of the NAM (November, Washington DC).
2. Iowa State University, Summer 10 [joint with Reza Rastegar (TA) and Chad Vidden (TA)].
Random walks in a game-theoretic environment.
The results were presented in MATHFEST of the MAA (Pittsburgh, August 2010), in SACNAS National Conference (Anaheim, October 2010), and in MAA Undergraduate Poster Session, Joint Mathematics Meetings (New Orleans, January 2011).

Undergraduate Thesis

Zheng Zhong, 2011.

Thesis: "On distribution tails of a stationary INAR(1) process"

Chen Hua, 2011.

Thesis: "Multi-type maximal branching process"

Long Wang, expected 2012.

Thesis: "Topics in Random Walks"

Honors Seminar

H322U, Mathematics of Paul Erdos; spring 2012.

Visiting student

Yue He (University of Minnesota), jointly with Arka P. Ghosh, spring 2012.

Presentations

2010 AMS Spring Central Section Meeting,
Special Session on Mathematical Developments in Cell and Systems Biology,
St. Paul, April 10.

SPA 2007,
Random Walks session,
Urbana-Champaign, August 07.

AMS 2006 Fall Western Section Meeting,
Special Session on Random Motion in Random Media,
Salt Lake City, October 06.

Mini-workshop on Random Walks in Random Environment,
Minneapolis, August 05.

Probability seminar, Iowa State University: September 07, November 07, April 08, September 09, October 10, March 11, September 11, February 12.

Probability Seminar,
University of Utah,
April 11

Probability Seminar,
University of Wisconsin-Madison,
November 08

Discrete Mathematics Seminar,
Iowa State University,
September 07, February 11.

Probability Seminar,
University of British Columbia,
May 07, November 06, March 05.

Probability Seminar,
University of California, Irvine,
February 07, April 06.

Seminar in Probability and Stochastic Processes,
Technion, Haifa,
February 07, January 04.

UBC Summer Probability School,
participant talk,
June 05.

Learning Seminar in Probability,
Technion, Haifa,
November 04.

Horowitz Seminar on Probability,
Ergodic Theory, and Dynamical Systems,
Tel-Aviv University, November 04.

Probability Seminar,
Arizona State University,
April 19.

Math Evolution Seminar,
Iowa State University,
October 10.

Monday Seminar,
Technical University of Berlin,
May 07.

Math Department Colloquium,
Iowa State University,
February 07, April 06.

Probability Seminar,
University of Minnesota, Minneapolis,
December 05.

Cornell Summer Probability School,
participant talk,
July 05.

Seminar on Algebra and Geometry,
University of Geneva,
November 04.

Seminar on Stochastic Processes,
ETH, Zurich,
January 04.

St. Flour Summer Probability School,
participant talk,
July 03.

Professional Activities

Referee for: Annals of Probability, ESAIM: Probability and Statistics, Stochastic Processes and their Applications, Annals of Institute Poincare, Proceedings of the Indian Academy of Sciences - Mathematical Sciences, Annales de l'institut Fourier, Probability Theory and Related Fields, Illinois Journal of Mathematics, Mathematical and Computer Modeling, Mathematical Reviews.

Member: AMS, Econometric Society.

Co-organizer of the Ames Symposium in Probability. Conference in honor of Krishna B. Athreya's 70th birthday, Ames, 18-19, September 09.

External evaluation of a tenure-track faculty, 2011.

Departmental Service, ISU

PHD committees:

Dajing Wu (Physics, Major Prof.: Kirill Tuchin)
Sevim Simsek (Math, Major Prof.: Domenico D'Alessandro)
Yiping Hao (Math, Major Prof.: Zhijun Wu)
Maksym Pryporov (Math, Major Prof.: Hailiang Liu)
Sambarta Dasgupta (EE, Major Prof.: Umesh Vaidya)
Sijia Liu, July 15, 2011 (Math, Major Prof.: Anastasios Matzavinos)
Darren Row, March 30, 2011 (Math, Major Prof.: Leslie Hogben)
Jun Li, November 4, 2009 (Physics, Major Prof.: James Vary)

Master's committees:

Richard Troll (Math, Major Prof.: Ananda Weerasinghe)

First-year faculty mentor:

Kuejai (Nan) Jungjaturapit, 2010.

Co-organizer of the Department Colloquium, 2008–2010.

Faculty (math biology) search committee, 2011-2012.

Awards

Special award for the Ph. D. thesis at the Department of Mathematics, Technion, 2004.

Prof. Elisha Nethaniyahu Award, Technion, 2004.

Sandor Szego Award for Excellence in Teaching, Technion, 2001.

Miriam and Aaron Gutwirth Excellence Scholarship, Technion, 1998.

Miscellaneous

Place and Date of Birth: St. Petersburg, Russia; April 23, 70.

Citizenship: Israeli.

Publications and Preprints

1. A. Matzavinos, A. Roitershtein, B. Shtylla, Z. Voller, S. Liu, and M. Chaplain,
On a stochastic model for a possible function of syntelic and merotelic kinetochores, submitted.
2. K. Jungjaturapit, T. Pluta, R. Rastegar, A. Roitershtein, M. Temba, C. N. Vidden, and
B. Wu,
Trading cookies in a gambler's ruin scenario,
submitted. The paper is outcome of a Summer'10 REU project at ISU.

3. R. Rastegar, A. Roitershtein, V. Roytershyen, and J. Suh,
Discrete-time Langevin motion of a particle in a Gibbsian random potential,
submitted.
4. A. Roitershtein and Z. Zhong,
On first-order random coefficient integer-valued autoregressive processes,
submitted.
5. R. Rastegar and A. Roitershtein,
Maximum occupation time of a transient excited random walk on \mathbb{Z} ,
submitted.
6. A. P. Ghosh, R. Rastegar, and A. Roitershtein,
On a directionally reinforced random walk,
submitted.
7. R. Basu and A. Roitershtein,
Divergent perpetuities modulated by regime switches,
submitted.
8. A. P. Ghosh, W. Qin, and A. Roitershtein,
Discrete-time Ornstein-Uhlenbeck process in a stationary dynamic environment,
submitted.
9. I. Ben-Ari, K. Boushaba, A. Matzavinos, and A. Roitershtein,
Stochastic analysis of the motion of DNA nanomechanical bipeds,
Bulletin of Mathematical Biology **57** (2011), 1932–1951.
10. A. P. Ghosh, E. Kleiman, and A. Roitershtein,
Large deviation bounds for functionals of Viterbi paths,
IEEE Transactions on Information Theory **57**(2011), 3932–3937.
11. I. Ben-Ari, A. Matzavinos, and A. Roitershtein,
On a species survival model,
Elect. Comm. in Probab. **16** (2011), 226–233.
12. D. Hay, R. Rastegar, and A. Roitershtein,
Multivariate linear recursions with Markov-dependent coefficients,
J. Multivariate Anal. **102** (2011), 521–527.
13. A. P. Ghosh, D. Hay, V. Hirpara, R. Rastegar, A. Roitershtein, A. Schulteis, and J. Suh,
Random linear recursions with dependent coefficients,
Statist. Probab. Lett. **80** (2010), 1597–1605.
The paper is outcome of a Summer'09 REU project at ISU.
14. A. P. Ghosh, A. Roitershtein, and A. Weerasinghe,
Optimal control of a stochastic processing system driven by a fractional Brownian motion input,
Adv. Appl. Probab. **42** (2010), 183–209.
15. I. Ben-Ari, M. Merle, and A. Roitershtein,
A random walk on \mathbb{Z} with drift driven by its occupation time at zero,
Stoch. Proc. Appl. **119** (2009), 2682–2710.

16. A. Roitershtein,
Transient random walks on a strip in a random environment,
Ann. Probab. **36** (2008), 2354–2387.
17. A. Roitershtein,
A note on multitype branching processes with immigrants in a random environment,
Ann. Probab. **35** (2007), 1573–1592.
18. A. Roitershtein,
One-dimensional linear recursions with Markov-dependent coefficients,
Ann. Appl. Probab. **17** (2007), 572–608.
19. A. Roitershtein,
A log-scale limit theorem for one-dimensional random walks in random environments,
Electron. Comm. Probab. **10** (2005), 244–253.
20. E. Mayer-Wolf, A. Roitershtein, and O. Zeitouni,
Limit theorems for one-dimensional transient random walks in Markov environments,
Ann. Inst. H. Poincaré (B) **40** (2004), 635–659.
21. A. Ben-Hur, A. Roitershtein, and H. T. Siegelmann,
On probabilistic analog automata,
Theor. Computer Science **320** (2004), 449–464.
22. H. T. Siegelmann, A. Roitershtein, and A. Ben-Hur,
Noisy neural networks and their generalization,
Advances in Neural Information Processing Systems **12** (2000), 335–341.

References

Prof. K. B. Athreya,
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(604) 822-3620, db5d@math.ubc.ca.

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