

Albert Cohen, PhD

CONTACT INFORMATION

Academic Specialist, Actuarial Sciences Program
Department of Mathematics
Department of Statistics and Probability
Michigan State University
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RESEARCH INTERESTS

Application of stochastic analysis to problems in risk theory, insurance, finance, operations research, and materials science. Currently, I am working on:

- Credit risk under partial information for bond pricing and credit spreads.
- Risk measures based on extremal statistics.
- Optimal agent behavior under reputational mechanisms.
- Optimal prediction of diffusions under uncertainty and under asymmetric information.

PROFESSIONAL MEMBERSHIPS

- [Society for Industrial and Applied Mathematics \(SIAM\)](#)
- [American Finance Association \(AFA\)](#)

ACADEMIC APPOINTMENTS

- Assistant Director / Director of Program Development** **Aug 2013 to present**
Actuarial Science Program, Michigan State University
Awarded Academic Specialist Continuing Status in June 2015.
- Affiliations
 - Department of Mathematics
(Chair: Dr. Keith S. Promislow)
 - Department of Statistics and Probability
(Chair: Dr. Frederi Viens)
- Acting Director and Program Coordinator** **Aug 2010 to Aug 2013**
Actuarial Science Program, Michigan State University
- Affiliations
 - Department of Mathematics
(Chair: Dr. Yang Wang)
 - Department of Statistics and Probability
(Chair: Dr. Hira Koul)
- Postdoctoral Researcher** **Aug 2007 to Aug 2010**
Department of Mathematics, Michigan State University
- “Unstable System Analysis and the Boltzmann Equation”
 - Supervisor: Professor Keith S. Promislow

EDUCATION

Carnegie Mellon University, Pittsburgh, PA

Ph.D., Mathematics, **August 2007.**

- Thesis Topic: A Probabilistic Analysis of Two Dimensional Grain Growth.
- Adviser: Professor David S. Kinderlehrer
- Areas of Study: Probability, Stochastic Calculus, Partial Differential Equations, Topological Networks.

Simon Fraser University, Vancouver. BC, Canada

M.S., Mathematics, July **2001.**

- Thesis Topic: Relaxation Methods in Micromagnetics.
- Adviser: Professor Rustum Choksi
- Area of Study: Applied Mathematics, Materials Science.

B.S., Applied Mathematics, May **1999.**

- *Honors*, First Class
- Minor in Physics

EDITORIAL POSITIONS

- [1] Editorial Board Member, *Risks*. (**2016-Present.**)
- [2] Co-Editor, *Risks*. Special Issue "Young Researchers in Insurance and Risk Management" (**2018.**)
- [3] Co-Editor, *Risks*. Special Issue "Recent Advances in Mathematical Modeling of the Financial Markets" (**2015.**)

PROFESSIONAL EDUCATION

- [4] PH125.1x: Data Science: R Basics, a course in the Harvard University (HarvardX) Professional Certificate in Data Science. (**2018.**)
- [5] PH125.2x: Data Science: Visualization, a course in the Harvard University (HarvardX) Professional Certificate in Data Science. (**2018.**)
- [6] CEBA 30000: Executive Certificate of Education in Credit Analysis, School of Business Administration, Oakland University, MI. (**2014.**)

REFEREED JOURNAL PUBLICATIONS

- [7] Jones, W., Rubinstein, J., Weintraub, J.N., Dass, S., Cohen, A., et.al. *Clinically meaningful Cardioprotection via the skin; nociceptor-induced cardioprotection in the NIC of time*. Accepted for publication in American Journal of Physiology-Heart and Circulatory Physiology. (**2018.**)
- [8] Cohen, A. and Costanzino, N. *A General Framework for Incorporating Stochastic Recovery in Structural Models of Credit Risk*. *Risks*. 5(4), 65. (**2017.**)
- [9] Cohen, A., and Costanzino, N. *Bond and CDS Pricing via the Stochastic Recovery Black-Cox Model*. *Risks*. 5(2), 26. (**2017.**)
- [10] Bradonjic M., Causley M., Cohen A. *Stochastic Optimal Control for Online Seller under Reputational Mechanisms*. *Risks*. 3(4), pp. 553-572. (**2015.**)
- [11] Cohen, A. *A Stochastic Approach to Coarsening in Cellular Networks* SIAM Multiscale Model. Simul. Volume 8, Issue 2, pp. 463-480 (**2010.**)
- [12] Cohen, A. *Examples of Optimal Prediction in the Infinite Horizon Case* Statistics and Probability Letters, Volume 80, Issue 11-12, pp 950-957 (**2010.**)

BOOKS EDITED

- [13] Cohen, A. *A Celebration of the Ties That Bind Us: Connections between Actuarial Science and Mathematical Finance*". Editor. Book is available for download and purchase from MDPI and purchase from Amazon. (**2018.**)

- TRADE JOURNAL ARTICLES [14] Cohen, A., Costanzino, N. *How To Price Recovery Risk*. April 2015. [CreditFlux](#). (2015.)
- UNDER REVIEW [15] Cohen, A., Costanzino, N. *Bond and CDS Pricing with Recovery Risk I: The Stochastic Recovery Merton Model*. Preprint available on SSRN. Submitted to the *Journal of Credit Risk*. Second round. (2019.)
- [16] Rietz, R.; Blumenschein, T.; Crough, S.; Cohen, A., *A Simulation-Based Approach to Minimizing Both the Probability and the Length of Financial Ruin in Retirement*. Submitted to the *Journal of Financial Planning*. (2019.)
- PREPRINTS AND WORKING PAPERS [17] Rietz, R.; Blumenschein, T.; Crough, S.; Cohen, A., *Analyzing Retirement Withdrawal Strategies*. Preprint available on [preprints.org](#). (2018.)
- [18] Cohen, A., Mason, D.E., and Mitchener, W.G. *Optimal Prediction of Brownian Bridge Processes*. Copies available upon request. (2017.)
- CONFERENCES ORGANIZED [19] *Joint Mathematics Meetings: AMS Special Session on Financial Mathematics, Actuarial Sciences, and Related Fields*. January 10-13, (2018.)
- [20] *Recent Trends in Mathematical Modeling of the Financial Markets*. AMS Sectional Meeting. March 14-15, (2015.)
- MAJOR CONFERENCE ACTIVITIES [21] Contributed Talks:
- AMS Joint Meetings, Seattle WA. Special Session on Problems and Challenges in Financial Engineering and Risk Management. January (2016.) (couldn't attend due to injury.)
 - SIAM General Meeting, Denver CO. July (2009.)
- [22] IPAM (Institute for Pure and Applied Mathematics) Workshops
- Nonlocal PDEs, Variational Problems and their Applications. February 27-March 2, (2012.)
 - New Directions in Financial Mathematics. January 5-8, (2010.)
 - Quantum and Kinetic Transport: Analysis, Computations, and New Applications (Long Program, (2009.))
- INVITED LECTURES AND PRESENTATIONS [23] **2019:** SIAM Conference on Financial Mathematics and Engineering (FM19) (Toronto, ON.) *MS16 New Directions in Credit Modeling - Part I of II* Bond, CDS, and CDO pricing under structural recovery models.
- [24] **2019:** New York University Tandon School of Engineering. (New York, NY.) *Finance and Risk Engineering Department Seminar*. Bond, CDS, and CDO pricing under structural recovery models.
- [25] **2019:** The School of Risk Management, Insurance and Actuarial Science at St. John's University. (New York, NY.) *Travelers Insurance Research Presentations*. Recent Developments in Mathematical Finance and Actuarial Science.
- [26] **2018:** Starbucks Corporation. (Seattle, WA.) Starbucks Marketing Science Series. *Dynamic Advertising Models on Large Networks: New Methods for Reputational Management*.
- [27] **2018:** College of Charleston. (Charleston, SC.) Departmental Seminar. *Modeling Online Networks and Seller Reputational Mechanisms via Stochastic Optimal Control*.

- [28] **2018:** Illinois State University. (Normal, IL) Departmental Seminar. A General Framework for Incorporating Stochastic Recovery in Structural Models of Credit Risk.
- [29] **2017:** College of Charleston. (Charleston, SC.) Departmental Colloquium. A General Framework for Incorporating Stochastic Recovery in Structural Models of Credit Risk.
- [30] **2017:** Bowling Green State University. (Bowling Green, OH.) Departmental Colloquium. Pricing Recovery Risk in Bonds and Swaps.
- [31] **2017:** Oakland University. (Rochester, MI.) SIAM Great Lakes Section 2017 Spring Meeting. Estimating Portfolio Beta in a Structural Credit Model.
- [32] **2017:** College of Charleston. (Charleston, SC.) Departmental Colloquium. Pricing Recovery Risk in Bonds and Swaps.
- [33] **2016:** University of Pittsburgh. (Pittsburgh, PA.) Financial and Actuarial Mathematics Seminar. Pricing Recovery Risk via a Partial Information Transform.
- [34] **2016:** Youngstown State University. Departmental Colloquium. Bond and CDS Pricing with Stochastic Recovery.
- [35] **2015:** University of Pittsburgh. (Pittsburgh, PA.) Special Lecture, Optimal Control: Applications in Risk Management and Online Markets.
- [36] **2015:** Carnegie Mellon University. (Pittsburgh, PA.) Joint Colloquium, Center for Non-linear Analysis and Center for Computational Finance. Bond and CDS Pricing with Stochastic Recovery.
- [37] **2015:** Carnegie Mellon University. (Pittsburgh, PA.) Methods of Mathematical Finance: a conference in honor of Steve Shreve's 65th birthday. Pricing Recovery Risk in Bonds and other Credit Products.
- [38] **2015:** University of Michigan. (Ann Arbor, MI.) Financial & Actuarial Mathematics Colloquium. Bond and CDS Pricing with Stochastic Recovery: Moody's PD-LGD Correlation Model.
- [39] **2014:** Albion College. (Albion, MI) . Math and Computer Science Colloquium. Credit Spreads with Stochastic Recovery : Connections with PDE's and Probability.
- [40] **2014:** Oakland University. (Rochester, MI) Applied Mathematics Conference. Credit Spreads with Stochastic Recovery : Connections with PDE's and Probability.
- [41] **2014:** Oakland University. (Rochester, MI) Third International Conference on Credit Analysis and Risk Management. Bond and CDS Pricing with Stochastic Recovery.
- [42] **2014:** Simon Fraser University. (Vancouver, BC, Canada.) Statistics and Actuarial Sciences Colloquium. Bond and CDS Pricing with Stochastic Recovery.
- [43] **2013:** Albion College. (Albion, MI.) Math and Computer Science Colloquium. [Developing an Actuarial Program: An open dialogue with faculty and students.](#)

- [44] **2012:** Albion College. (Albion, MI.) Math and Computer Science Colloquium. Stochastic Optimal Control Models for Online Stores.
- [45] **2012:** College of Charleston. (Charleston, SC.) Mathematics Colloquium. Optimal Prediction: History, Applications, and Potential Directions.
- [46] **2012:** Jackson National Insurance. (Okemos, MI.) [Review of material and practice for SOA Exam MLC.](#)
- [47] **2012:** Michigan State University. (East Lansing, MI.) Alumni Distinguished Scholars Recruitment Event. Two Lines: An Introduction to Black-Scholes-Merton Pricing Theory for Advanced High School Students.
- [48] **2011:** Albion College. (Albion, MI.) Math and Computer Science Colloquium. Uncertainty, Optimization, and Prediction.
- [49] **2011:** Auto-Owners Insurance. (Lansing, MI.) [Review of material and practice for SOA Exam MFE.](#)
- [50] **2011:** Wilfrid Laurier University. (Waterloo, ON, Canada.) Mathematics Colloquium. Optimal Prediction: History, Applications, and Potential Directions.
- [51] **2010:** University of Cincinnati. (Cincinnati, OH.) Probability Seminar. A Stochastic Approach to Coarsening in Cellular Networks.
- [52] **2009:** College of Charleston. (Charleston, SC.) Mathematics Colloquium. A Stochastic Approach to Coarsening in Cellular Networks.
- [53] **2009:** University of Michigan. (Ann Arbor, MI.) Applied and Interdisciplinary Mathematics Seminar. A Stochastic Approach to Coarsening in Cellular Networks.

ACADEMIC
SERVICE

Teaching Specialist Search Committee

Committee Member, Michigan State University. Discussed and selected from faculty applications. **2017.**

Council on Diversity and Community

Council Member, College of Natural Science, Michigan State University. **2014-15.**

Honors College Committee, Alumni Distinguished Scholarship

Committee Member, Michigan State University. Discussed and selected from student applications. **2013-14.**

Honors College, Faculty Mentor

Faculty Mentor for Professorial Assistant, Michigan State University. Mentored student in MSU Honors College in terms of academics and job preparation. **2012-15.**

Actuarial Scholarship Committee

Committee Chair, Michigan State University. Discussed and selected from student applications. **2011-14.**

Actuarial Specialist Search Committee

Committee Chair, Michigan State University. Discussed and selected from faculty applications. **2013.**

Corporate and Alumni Liaison

Michigan State University. Interacted with alumni and industry, advocate for our students and program. Helped to connect and solidify relations with local and national companies such as Humana, the Accident Fund, and Auto-Owners Insurance. **2010-2014.**

Actuarial Faculty Recruitment

Michigan State University. Due to the shortage of faculty to teach and advise in our program, I have helped to recruit adjunct faculty in Dr. Darren Mason (Albion College) and Jacob Geyer (the Accident Fund) to fill these roles. **2012-2014.**

STUDENT
ADVISING AND
MENTORING

Jonathan DiClemente

Undergraduate student in Actuarial Science and Mechanical Engineering, Michigan State University. Advised on career possibilities and entrepreneurship. Reference for successful application to M.Eng and MBA at Carnegie Mellon University. **2011–2013.**

Jimmy Dunn

Undergraduate student in Actuarial Science, Michigan State University. Advised on career possibilities and on Honors project on [Divorce Insurance](#) This work was presented at the Second Simon Lecture in Actuarial Science, Fall 2013 (MSU.) **2011–2013.**

Andrew Grossman

Masters student in Mechanical Engineering, Michigan State University. Thesis Committee Member, advised on financial analysis of solar cell installation and automation. Thesis: [Solar Photovoltaic Design Tool for non-Residential Buildings: From Blueprints to Array.](#) **2013–2014.**

Charles Lewis

Undergraduate student in Actuarial Science and Economics, Michigan State University. Advised on career possibilities and on Math 491B special project: [A Predictive Analytics Approach to the Merton Model in Default Modeling of Credit Products.](#) **2015.**

James P. Regan

Undergraduate student in Actuarial Science, Michigan State University. Advised on career possibilities and on project on [Using Predictive Modeling to Price Options.](#) This work was presented at the 2014 Undergraduate Research Seminar and will be presented at the [Third Simon Lecture in Actuarial Science](#), Fall 2014 (MSU.) **2012–2014.**

James Risk

Masters student in Statistics, Michigan State University. Advised on graduate school and academic career. Mentored research on [Correlations between Google search data and Mortality Rates.](#) Mentored as TA supervisor. Reference for successful application to PhD program in Statistics at UC Santa Barbara. **2012–2013.**

Irena Tesnjak

PhD Student in Statistics, Michigan State University. Thesis Committee Member. Dissertation Topic: [Superpositions of Ornstein-Uhlenbeck type processes driven by Levy noise and their applications to financial modeling.](#) **2015–2017.**

TEACHING
EXPERIENCE

Michigan State University, East Lansing, MI

Faculty Actuarial Science Program

2010-Present

- Developed curriculum for courses in tandem with new BS degree in Actuarial Science.
- Lectured in these courses, developing professionally typeset lecture slides to aid in communication of major ideas in risk management.

- These classes include: Math 360,361,458 and STT 441,455,456, and 459. I have taught classes for SOA exams P,FM,MLC,MFE, & C.
- Also taught and developed typeset lecture notes for Math 320 (Analysis) and Math 301 (Math Education and Analysis.) Faculty at MSU and in both American and European universities have used these lecture notes in their class preparation.
- Faculty supervisor of projects in [Master of Science in Industrial Mathematics](#) for Auto-Owners Insurance and Consumers Energy . **2011-2013**
- Developed and taught a [Graduate Seminar in Enterprise Risk Management](#). Recruited graduate students and faculty to contribute presentations and lectures. **Spring 2013**
- Developed and taught a course in Insurance and Financial Economics for visiting students in the [Discovering America Program](#). **Summer 2013**
- Mentored a group of visiting students in the [Discovering America Program](#) who also enrolled in my Financial Derivatives for Actuaries (Math 458) class. Met weekly outside of class and worked with them on extra credit work and spoken English . **Fall 2013**
- Faculty supervisor of Math 491b project in pension plans and gainsharing. This work was presented by the students at the [Third Simon Lecture in Actuarial Science](#).
- Joint appointment in Department of Statistics.
- Sample student evaluations available upon request.

Visiting Research Instructor Department of Mathematics

2007-2010

- Lectured in both freshman and junior/senior courses.
- These classes include: Math 132,360, 457.
- Sample student evaluations available upon request.

Carnegie Mellon University, Pittsburgh, PA

Graduate Instructor and Teaching Assistant

2001 to 2007

- Instructor for MTH 122: Calculus 2 for Humanities and Social Sciences.
- Instructor for Summer course in Sequences and Series.
- Graduate Assistant in Master of Science in Computational Finance program. TA for classes in Stochastic Calculus, Term Structure, and Multi-Period Asset Pricing. Worked on Pittsburgh and New York campuses.

PROFESSIONAL SERVICE

Referee Service

- *Axioms*: **2018**
- *European Actuarial Journal*: **2018**
- *Risks*: **2015,2018**
- *Journal of Credit Risk*: **2014**
- *SIAM Journal of Control*: **2009,2014**

EXPERTISE

Mathematics:

- Applied Mathematics
- Probability and Stochastic Processes
- Modeling

Financial Engineering:

- Credit Risk and Risk Management
- Connections with Insurance Modeling

COMMUNITY OUTREACH

- I have been involved with the high school recruiting efforts by MSU at the Department of Mathematics and the Honors College

- This effort includes making presentations off campus and attending evening functions to interact with parents and students and advocating for our programs at MSU. I believe very strongly in recruitment to build a strong program in actuarial science as well as mathematics, and I look forward to continuing with the efforts.
- I have been very involved as a media liaison for the actuarial program, setting up and being interviewed in local TV coverage and print media ([The State News](#) and [The Lansing State Journal](#).)
- I have also helped produce a [major promotional video](#) for our BS in Actuarial Science program with [Good Fruit Video](#).
- I also helped the College of Natural Science to establish the [Ron and Mary Simon Lecture in Actuarial Science](#) in honor of our donors. This event has become a centerpiece of our partnership with industry in Michigan, and has attracted top industrial and academic lecturers to give the keynote address.
- I was involved (2014) with the [City of Lansing's Financial Health Team \(FHT\)](#) as a co-faculty advisor and liaison between students in our Actuarial program and the team put together by Mayor Virg Bernero. Activities included participating in the Lansing City Council Retreat in September 2014 and the FHT Quarterly Meetings in October 2014 and January 2015.

AWARDS

Michigan State University

- The College of Natural Science Faculty Teaching Prize. College of Natural Science. 2014.
- The J. S. Frame Teaching Excellence Award. Department of Mathematics. 2014.
- Department of Residence Life: Recognition of Faculty Who Inspire Students. 2008, 2009.

CITIZENSHIP & RESIDENCY

- Canada: Citizen.
- USA: Permanent Resident.

LANGUAGES

- Portuguese: Fluent (mother tongue)
- English: Fluent
- French, Hebrew: Familiar

TECHNICAL SKILLS

- \LaTeX ¹, in multiple environments (Linux, macOS, PC.)
- R, Matlab, Mathematica: Familiar.
- Data Science: Under Development.

COMMITMENT TO DIVERSITY

As a non-native English speaker, I closely identify with students who are also non-native English speakers. I have found nothing but joy in interacting with students at Michigan State and Carnegie Mellon that are from different cultures. As the son of a proud Brazilian, it is of great importance to me to maintain my rich Latin American heritage. One way I am able to contribute to my heritage is through membership and activity in the Brazilian Community of MSU: [Brazuca - Comunidade Brasileira](#). I also look forward to deepening my involvement with ESL speakers on campus and Michigan State's continuing focus on making this a more inclusive and welcoming campus.

EXTERNAL REFERENCES AVAILABLE TO CONTACT

Dr. Milan Bradonjić (e-mail: bradonjic@gmail.com / homepage: <http://bradonjic.com/>)

- Visiting Scholar, Rutgers University, New Brunswick, NJ
- ★ *Dr. Bradonjić is a collaborator on my research on modeling online stores and agent behavior.*

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Dr. Matthew Causley (e-mail: mcausley@kettering.edu; phone: +1-810-762-7902)

- Assistant Professor of Mathematics, Department of Mathematics, Kettering University
- ★ *Dr. Causley is a collaborator on my research on modeling online stores and agent behavior.*

Dr. Martin Jones (e-mail: jonesm@cofc.edu; phone: +1-843-953-5730)

- Professor of Mathematics, Department of Mathematics, College of Charleston
- ★ *Dr. Jones has been a mentor of mine since 2007.*

Dr. David S. Kinderlehrer (e-mail: davidk@andrew.cmu.edu; phone: +1-412-258-5729)

- Alumni Professor of Mathematical Sciences, Department of Mathematical Sciences, Carnegie Mellon University
- ★ *Dr. Kinderlehrer was my PhD supervisor.*

Dr. W. Garrett Mitchener (e-mail: mitchenerg@cofc.edu; phone: +1-843-953-2484)

- Assistant Professor of Mathematics, Department of Mathematics, College of Charleston
- ★ *Dr. Mitchener is my collaborator on my work on optimal prediction of the maximum of a Brownian bridge.*

Dr. Goran Peskir (e-mail: goran@maths.man.ac.uk; phone: +44 (0)161 306 3215)

- Programme Director, MSc Mathematical Finance, School of Mathematics, The University of Manchester
- Professor of Probability (Chair)
- Founding Head of Probability and Statistics (2005-2009)
- ★ *Dr. Peskir is a mentor, in my career in general as well as on research into the optimal prediction of the maximum of a diffusion with uncertain drift.*

Dr. Yang Wang (e-mail: yangwang@ust.hk; phone: +011 (852) 2358-7412)

- Professor of Mathematics (Chair) Department of Mathematics, Hong Kong University of Science and Technology
- ★ *Dr. Wang was my Chair and Mentor when I began my position as Acting Director for the Actuarial Program at MSU in 2010, continuing until 2014. Dr. Wang can also comment on my teaching style and awards won.*