Albert Cohen, PhD

Contact Information	Senior Academic Specialist, Actuarial Sciences Program Department of Mathematics Department of Statistics and Probability Michigan State University <i>E-mail:</i> acohen@msu.edu https://www.researchgate.net/profile/Albert_Cohen3 https://linkedin.com/in/albert-cohen-3424b325 <i>Office:</i> 517-355-4592 <i>Campus Address:</i> C336 Wells Hall
RESEARCH Interests	Application of stochastic analysis to problems in risk theory, insurance, finance, opera- tions research, and materials science. Some of the problems I work on and think about include:
	• Applications of Structural Modeling & Statistical Learning to problems in Sports Analytics.
	• 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.
Curriculum Development	Risk Management and Machine Learning, Actuarial Science, and Sports Analytics Since 2010, I have built curriculum and developed programs in
AND PROMOTION	Actuarial Science.
	Machine Learning and Risk Analytics for a Corporate Audience.
	Graduate training in Sports Analytics.
	Undergraduate Research in Sports Analytics.
	Analytics for College Hockey.
	To promote this, I have been part of
	• a spotlight on a national sports network (Big Ten Network - Spartans All-Access.)
	• program videos developed with Good Fruit Video.
	• local podcasts focusing on education, insurance, and sports.
	• local TV, radio, print media, and college departmental newsletter articles.
Professional Memberships	 American Risk and Insurance Association (ARIA.) Society for American Baseball Research (SABR.)
Editorial Positions	 Associate Editor, Risk Management and Insurance Review. (2025-present.) Editorial Board Member, <i>Risks.</i> (2016-2024.) Co-Editor, <i>Risks.</i> Special Issue "Young Researchers in Insurance and Risk Management" (2019-20.) Co-Editor, <i>Risks.</i> Special Issue "Recent Advances in Mathematical Modeling of the Financial Markets" (2015.)

ACADEMIC APPOINTMENTS	Director, Actuarial Program Actuarial Science Program, Michigan State University	Aug 2022 to Present
	 Affiliations Department of Mathematics (Chair: Dr. Jeffrey Schenker) Department of Statistics and Probability (Chair: Dr. Hao Zhang) Director, Graduate Certificate in Sports Analytics (GCSA) GCSA, Michigan State University 	May 2022 to Present
	 Affiliations Department of Mathematics (Chair: Dr. Keith S. Promislow) Department of Statistics and Probability (Chair: Dr. Lyudmila Sakhanenko) Director of Program Development and Corporate Education 	Aug 2020 to Aug 2022
	 Actuarial Science Program, Michigan State University Awarded Senior Academic Specialist with Continuing Status in A Affiliations Department of Mathematics (Chair: Dr. Keith S. Promislow) Department of Statistics and Probability (Chair: Dr. Lyudmila Sakhanenko) 	ugust 2021.
	 Assistant Director / Director of Program Development 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) 	Aug 2013 to Aug 2020
	 Acting Director and Program Coordinator Actuarial Science Program, Michigan State University Affiliations Department of Mathematics (Chair: Dr. Yang Wang) Department of Statistics and Probability (Chair: Dr. Hira Koul) 	Aug 2010 to Aug 2013
	 Postdoctoral Researcher Department of Mathematics, Michigan State University "Unstable System Analysis and the Boltzmann Equation" Supervisor: Dr. Keith S. Promislow 	Aug 2007 to Aug 2010
EDUCATION	Carnegie Mellon University, Pittsburgh, PA	
	Ph.D., Mathematics, August 2007.	
	 Thesis Topic: A Probabilistic Analysis of Two Dimensional G Adviser: Professor David S. Kinderlehrer 	rain Growth.

RESEARCH GROUPS • Risk Management and Sports Analytics.

	 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. <i>Honors</i>, First Class Minor in Physics
Professional Education	• PH125.1x: Data Science: R Basics, a course in the Harvard University (HarvardX) Professional Certificate in Data Science. (2018.)
	• PH125.2x: Data Science: Visualization, a course in the Harvard University (HarvardX) Professional Certificate in Data Science. (2018.)
	• CEBA 30000: Executive Certificate of Education in Credit Analysis, School of Business Administration, Oakland University, MI. (2014.)
MEDIA AND Community Outreach	 Interviews on morning tv, local evening news, Michigan NPR and Detroit-area talk radio during March Madness (2025.) Multiple appearances on The Drive with Jack Ebling to discuss sports analytics with a general sports audience (2022-present.) Featured hour long interview on the Tom Matt show, entitled It's More Than Numbers with Dr. Albert Cohen. (2024.) Presentation at the Museum of Mathematics (NYC, virtual) entitled Meet a Mathematician. (2024.) Helped produce multiple promotional videos for our programs in actuarial science and sports analytics, in partnership with Good Fruit Video. Deeply involved with recruiting efforts by MSU at the Department of Mathematics and the Honors College. This includes mentoring multiple professorial assistants. On-campus, I serve as faculty liasion/mentor for the actuarial and sports analytics student clubs. Activities have included bringing guest speakers to these clubs, such as Jalen Watts-Jackson and Jack Ebling. I am also proud to have participated in the 2020 and 2021 Traveler's Actuarial and Analytics High School Days. Please see my 2020 interview as part of the College and Career Readiness Panel, with an introduction available here. 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. I have also been fortunate to help develop an analytics team for MSU Hockey, which was featured on the Big Ten Network via the Spartans All-Access show in December 2021. I also helped the College of Natural Sciences 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. We have also expanded this effort to include the Simon Conference for Young Researchers in Risk Management and Insurance. This effort

- PUBLICATIONS [1] Cohen, A. and Annette Hofmann. *Regretful Risks: A Partial Explanation of the Insurance Distortion Puzzle*. Finance Research Open, Volume 1, Issue 2, 2025 doi: https://doi.org/10.1016/j.finr.2025.100001 (**2025**.)
 - [2] Cohen, A. and Jimmy Risk. *European football player valuation: integrating financial models and network theory.* Journal of Quantitative Analysis in Sports 0 (2025.).
 - [3] Cohen, A. A dynamic pythagorean exponent: Applications to baseball and structural modeling in risk management. Risk Management and Insurance Review 27.3: 243-255. (2024.)
 - [4] Cohen, A. and Nick Costanzino. *Merton's Model with Recovery Risk*. Journal of Credit Risk (2022.)
 - [5] Cohen, A. and Sooie-Hoe Loke. So You Want to Price and Invest in Options? Mathematics Research for the Beginning Student, Volume 2: Accessible Projects for Students After Calculus. Cham: Springer International Publishing,101-125. (2022.)
 - [6] 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.* Am J Physiol Heart Circ Physiol 316: H543–H553, 201. (2019.)
 - [7] Cohen, A. and Nick Costanzino. A General Framework for Incorporating Stochastic Recovery in Structural Models of Credit Risk. Risks. 5(4), 65. (2017.)
 - [8] Cohen, A., and Nick Costanzino. Bond and CDS Pricing via the Stochastic Recovery Black-Cox Model. Risks. 5(2), 26. (2017.)
 - [9] Bradonjic M., Causley M., and Cohen A. Stochastic Optimal Control for Online Seller under Reputational Mechanisms. Risks. 3(4), pp. 553-572. (2015.)
 - [10] Cohen, A. A Stochastic Approach to Coarsening in Cellular Networks SIAM Multiscale Model. Simul. Volume 8, Issue 2, pp. 463-480 (2010.)
 - [11] Cohen, A. Examples of Optimal Prediction in the Infinite Horizon Case Statistics and Probability Letters, Volume 80, Issue 11-12, pp 950-957 (2010.)
- PREPRINTS AND [12] Parmar, A., Dewig, D., Cohen, A., Bullock, G., Gatti, A., and Harkey, M. (2025, February 3). Baseball Pitching Kinematic Synergies Associated with Pitch Velocity and Injury Risk Factors. Retrieved from osf.io/52uzr (2025.)
 - [13] Cohen, A. and Esposito, E.X.. A Multi-State Model for Goalie Pulling towards the End of the Third Period (2024.)
 - [14] Cohen, A. and Loke, S-H. Optimal Cancellation of Policies under Tax Considerations. (2024.)
 - [15] Stein, H.J., Cohen, A., and Costanzino, N. A Unified Framework for Default Modeling. Preprint available at SSRN (2022.)
 - [16] Rietz, R., Blumenschein, T., Crough, S., Cohen, A., and Coleman, J. A Simulation-Based Approach to Minimizing Both the Probability and the Length of Financial Ruin in Retirement. Preprint available at SSRN. (2020.)
 - [17] Rietz, R.; Blumenschein, T.; Crough, S.; Cohen, A., *Analyzing Retirement Withdrawal Strategies*. Preprint available at **preprints.org.** (2018.)

Books Edited	[18] Cohen, A. and Loke, S-H. An Invitation to Undergraduate Research in Risk Management - Actuarial Science, Mathematical Finance, and Sports Analytics. Co-Editor. The book is forthcoming and is part of the Springer book series, 'Foundations for Undergraduate Research in Mathematics.' (In Production.) (2025.)
	[19] Cohen, A. A Celebration of the Ties That Bind Us: Connections between Actuarial Science and Mathematical Finance". Editor. Available for download and purchase from MDPI and purchase from Amazon. (2018.)
TRADE JOURNAL AND PROFESSIONA NEWSLETTER ARTICLES	 [20] Cohen, A., Lee, G., and Liu, H. <i>The Second Simon Conference Takes Place at MSU</i> April 2024. Expanding Horizons (Society of Actuaries.) (2024.)
	[21] Cohen, A., Lee, G., Moenig, T., and Viens, F. Inaugural Simon Conference for Young Researchers in Risk Management and Insurance. June 2020. Expanding Horizons (So- ciety of Actuaries.) (2020.)
	[22] Cohen, A., Costanzino, N. How To Price Recovery Risk. April 2015. CreditFlux. (2015.)
Conferences Organized	 Simon Conference for Young Researchers in Risk Management and Insurance November 17-18, (2023.)
	• Simon Conference for Young Researchers in Risk Management and Insurance November 22-23, (2019.)
	• SIAM Conference on Financial Mathematics & Engineering (FM19): New Directions in Credit Modeling June 5-6, (2019.)
	• Joint Mathematics Meetings: AMS Special Session on Financial Mathematics, Actuarial Sciences, and Related Fields. January 10-13, (2018.)
	• Recent Trends in Mathematical Modeling of the Financial Markets. AMS Sectional Meeting. March 14-15, (2015.)
Major Conference Activities	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.)
	• 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

- 2025: University of Michigan (Ann Arbor, MI.) Michigan Sports Analytics Society Annual Conference. Extensions to the Moneyball Theorem.
- 2025: Simon Fraser University (Virtual.) SFU Sports Analytics Group Virtual Seminar Series. Network Theory and Soccer Player Performance Valuation.
- 2025: Albion College (Albion, MI.) Joint Communication Studies and Math/Computer/Data Science seminar on sports analytics. Network Theory and Soccer Player Performance Valuation.
- 2024: Loyola Marymount University (Chicago, IL.) Mathematics and Statistics Colloquium Series. A dynamic pythagorean exponent: Applications to baseball and structural modeling in risk management.
- 2024: Central Washington University (Ellensburg, WA.) Mount Stuart Mathematics Seminar - Summer REU Series. Mathematics of Contract Pricing in Sports Analytics.
- 2024: University of Michigan (Ann Arbor, MI.) Michigan Sports Analytics Society Annual Conference. Performance Valuation and Sports Analytics.
- 2024: University of Cincinatti (Cincinatti, OH.) Carl H. Lindner III Center for Insurance and Risk Management European Football Player Valuation: Integrating Financial Models and Network Theory
- 2023: Carnegie Mellon University (Pittsburgh, PA.) Carnegie Mellon Sports Analytics Conference Mathematical Models of Player Contract Valuation. Video of lecture available here
- **2023:** UNC-Asheville (Asheville, NC.) **Osher Lifelong Learning Institute** The Life of a Lonely Neuron from the Perceptron model to modern AI.
- 2023: Albion College (Albion, MI.) Joint Communication Studies and Math/Computer/Data Science seminar on sports analytics. Mathematical Models of Player Contract Valuation.
- 2021: Central Washington University (Ellensburg, WA.) Mount Stuart Mathematics Seminar - Summer REU Series. Credit Risk Analysis via Data and Structural Models.
- 2021: Universidade Federal de Santa Catarina, Campus Florianapolis (Florianopolis, Brazil.) Coloquio de Matematica. Pricing Bonds Under Structural Recovery Models.
- 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.
- **2019:** The School of Risk Management, Insurance and Actuarial Science at St. John's University. (New York, NY.) **Travelers Insurance Research Presentations.** Pricing Recovery Risk in Bonds and Swaps.
- 2018: Starbucks Corporation. (Seattle, WA.) Starbucks Marketing Science Series. Dynamic Advertising Models on Large Networks: New Methods for Reputational Management.
- **2018:** College of Charleston. (Charleston, SC.) **Departmental Seminar.** Modeling Online Networks and Seller Reputational Mechanisms via Stochastic Optimal Control.
- 2018: Illinois State University. (Normal, IL.) Departmental Seminar. A General Framework for Incorporating Stochastic Recovery in Structural Models of Credit Risk.
- **2017:** College of Charleston. (Charleston, SC.) **Departmental Colloquium.** A General Framework for Incorporating Stochastic Recovery in Structural Models of Credit Risk.

- **2017:** Bowling Green State University. (Bowling Green, OH.) **Departmental Colloquium.** Pricing Recovery Risk in Bonds and Swaps.
- 2017: Oakland University. (Rochester, MI.) SIAM Great Lakes Section 2017 Spring Meeting. Estimating Portfolio Beta in a Structural Credit Model.
- 2017: College of Charleston. (Charleston, SC.) Departmental Colloquium. Pricing Recovery Risk in Bonds and Swaps.
- 2016: University of Pittsburgh. (Pittsburgh, PA.) Financial and Actuarial Mathematics Seminar. Pricing Recovery Risk via a Partial Information Transform.
- **2016:** Youngstown State University. (Youngstown, OH.) **Departmental Colloquium.** Bond and CDS Pricing with Stochastic Recovery.
- **2015:** University of Pittsburgh. (Pittsburgh, PA.) **Special Lecture**, Optimal Control: Applications in Risk Management and Online Markets.
- **2015:** Carnegie Mellon University. (Pittsburgh, PA.) **Joint Colloquium**, Center for Nonlinear Analysis and Center for Computational Finance. Bond and CDS Pricing with Stochastic Recovery.
- 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.
- 2015: University of Michigan. (Ann Arbor, MI.) Financial & Actuarial Mathematics Colloquium. Bond and CDS Pricing with Stochastic Recovery.
- **2014:** Albion College. (Albion, MI). **Math and Computer Science Colloquium.** Credit Spreads with Stochastic Recovery : Connections with PDE's and Probability.
- **2014:** Oakland University. (Rochester, MI.) **Applied Mathematics Conference.** Credit Spreads with Stochastic Recovery : Connections with PDE's and Probability.
- 2014: Oakland University. (Rochester, MI.) Third International Conference on Credit Analysis and Risk Management. Bond and CDS Pricing with Stochastic Recovery.
- 2014: Simon Fraser University. (Vancouver, BC, Canada.) Statistics and Actuarial Sciences Colloquium.Bond and CDS Pricing with Stochastic Recovery.
- **2013:** Albion College. (Albion, MI.) **Math and Computer Science Colloquium.** Developing an Actuarial Program: An open dialogue with faculty and students.
- **2012:** Albion College. (Albion, MI.) **Math and Computer Science Colloquium.** Stochastic Optimal Control Models for Online Stores.
- **2012:** College of Charleston. (Charleston, SC.) **Departmental Colloquium.** Optimal Prediction: History, Applications, and Potential Directions.

- 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.
- 2011: Albion College. (Albion, MI.) Math and Computer Science Colloquium. Uncertainty, Optimization, and Prediction.
- **2011:** Wilfrid Laurier University. (Waterloo, ON, Canada.) **Mathematics Colloquium.** Optimal Prediction: History, Applications, and Potential Directions.
- **2010:** University of Cincinnati. (Cincinnati, OH.) **Probability Seminar.** A Stochastic Approach to Coarsening in Cellular Networks.
- **2009:** College of Charleston. (Charleston, SC.) **Mathematics Colloquium.** A Stochastic Approach to Coarsening in Cellular Networks.
- 2009: University of Michigan. (Ann Arbor, MI.) Applied and Interdisciplinary Mathematics Seminar. A Stochastic Approach to Coarsening in Cellular Networks.

TEACHING Experience

Michigan State University, East Lansing, MI

Faculty

2010-Present

- Developed and updated curriculum for courses in tandem with BS degree in Actuarial Science and BS in Quantitative Risk Analytics.
- Developed a new certificate in sports analytics for a graduate and professional audience.
- In Fall '23,I developed and taught a new class (Math 801), on the mathematics of machine learning algorithms, for this audience.
- Also in Fall '23, I taught another brand-new class on sports analytics and risk management from the viewpoint of contract valuation. This has taken multiple years and reading courses to test the material in an undergraduate setting.
- I am proud to say that this is a new course for the math dept, starting in Spring 2025, and will be known as **Math 362**.
- This been part of a general plan to introduce topics in sports analytics and machine learning for a wide audience, meeting student demand.
- Developed curriculum and taught classes in mathematical and algorithmic foundations of machine learning for the Certificate in Quantitative Risk Analytics with AF Group. (2019-2022.)
- 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.
- Faculty supervisor of multiple graduate projects in the Master of Science in Industrial Mathematics program. (2011-2013,2019.)
- 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 on topics in mathematical finance and insurance. (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 and Probability.

	Lectured in both freshman and junior/senior courses.These classes include: Math 132,360, and 457.	
	Carnegie Mellon University, Pittsburgh, PA	
	Graduate Instructor and Teaching Assistant 2001 to 200)7
	 Instructor for 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. 	or
PROFESSIONAL	Referee Service	
SERVICE	• Axioms • European Actuarial Journal	
	Risks	
	Journal of Credit Risk	
	SIAM Journal of Control Bish Management and Lawrence Basian	
	Kisk management and insurance Keview	
Expertise	Mathematics:	
	Applied Mathematics	
	Probability and Stochastic ProcessesModeling	
	Financial Engineering:	
	Credit Risk and Risk Management Connections with Insurance Modeling	
	Connections with Sports Analytic and Contract Valuation	
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	• Canada: Citizen.	
	• USA: Citizen (Naturalized.)	
LANGUAGES	• Portuguese: Fluent (first language)	
	• English: Fluent	
	• French, Hebrew: Familiar	
TECHNICAL SKILLS	• LATEX ¹ , in multiple environments (Linux,macOS,PC.)	
	• R: intermediate programming skills	
	• Manao, Mathematica: Familiar.	
EXTERNAL		
AVAILABLE TO CONTACT	¹ CV layout modified by user in LaTex, original copyright (c) 2007, 2008, 2009, 2010, 2011 by Theodore P. Pavli Licensed under the Creative Commons Attribution-Noncommercial 3.0 United States License.	ic.

Visiting Research Instructor Department of Mathematics

2007-2010

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

- Professor Emeritus of Mathematics, Department of Mathematics, College of Charleston
- \star 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. Sooie-Hoe Loke (e-mail: SooieHoe.Loke@cwu.edu; phone: +1-509-963-2602)

- Assistant Professor of Mathematics, Department of Mathematics, Central Washington University
- * Dr. Loke is my collaborator on undergraduate research in actuarial science as well as on optimal policy cancellation.

Dr. Yang Wang (e-mail: yangwang@ust.hk; phone: +011 (852) 2358 7267)

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