

# Bin Zou

## Curriculum Vitae

Department of Mathematics  
University of Connecticut  
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<https://sites.google.com/site/zoubin019/>

### Research Interests

- Mathematical Finance, Actuarial Science, Stochastic Control and Optimization

### Education

- Ph. D. in Mathematical Finance (June 2015)  
University of Alberta, Edmonton, Alberta, Canada
- M. S. in Mathematics (June 2009)
- B. S. in Information and Computing Science (July 2007)  
Beijing Institute of Technology, Beijing, China

### Employment

- 8/2017 - Present, Tenure-track Assistant Professor  
Department of Mathematics, University of Connecticut, Storrs, CT, U.S.A.  
Courtesy adjunct appointment with the Department of Statistics since Spring 2019
- 9/2016 - 8/2017, Acting Assistant Professor  
Department of Applied Mathematics, University of Washington, Seattle, WA, U.S.A.
- 5/2015 - 4/2016, TUFF Fellow; 5/2016 - 8/2016, Research Assistant  
Group of Mathematical Finance, Technical University of Munich, Munich, Germany

### Publications in Peer-Reviewed Journals

1. Deng, J., Pan, H., Zhang, S. and Zou, B., 2021. Optimal bitcoin trading with inverse futures. *Annals of Operations Research*, accepted. [[PDF](#)] [[SSRN](#)]
2. Lorig, M., Zhou, Z., and Zou, B., 2021. Optimal bookmaking. *European Journal of Operational Research*, forthcoming. [[Journal](#)] [[arXiv](#)]
3. Shen, Y. and Zou, B., 2021. Mean-variance investment and risk control strategies – A time-consistent approach via an auxiliary process. *Insurance: Mathematics and Economics*, 97, 68-80. [[Journal](#)] [[arXiv](#)]
4. Deng, J. and Zou, B., 2021. Quadratic hedging for sequential claims with random weights in discrete time. *Operations Research Letters*, 49(2), 218-225. [[Journal](#)] [[arXiv](#)]
5. Lorig, M. and Zou, B., 2021. Bond indifference prices. *Quantitative Finance*, forthcoming. [[Journal](#)] [[SSRN](#)]
6. Deng, J., Pan, H., Zhang, S., and Zou, B., 2020. Minimum-variance hedging of bitcoin inverse futures. *Applied Economics*, 52(58), 6320-6337. [[Journal](#)] [[SSRN](#)]
7. Chen, D., Deng, J., Feng, J., Zou, B., 2020. A set-valued Markov chain approach to credit default. *Quantitative Finance*, 20(4), 669-689. [[Journal](#)] [[SSRN](#)]

8. Lorig, M., Zhou, Z., and Zou, B., 2019. A mathematical analysis of technical analysis. *Applied Mathematical Finance*, 26(1), 38-68. [[Journal](#)] [[arXiv](#)]
9. Cui, Z., Feng, Q., Hu, R. and Zou, B., 2018. Systemic risk and optimal fee for central clearing counterparty under partial netting. *Operations Research Letters*, 46(3), 306-311. [[Journal](#)] [[SSRN](#)]
10. Zou, B., 2017. Optimal investment in hedge funds under loss aversion. *International Journal of Theoretical and Applied Finance*, 20(03), 1750014. [[Journal](#)] [[PDF](#)]
11. Zou, B. and Zagst, R., 2017. Optimal investment with transaction costs under cumulative prospect theory in discrete time. *Mathematics and Financial Economics*, 11(4), 393-421. [[Journal](#)] [[arXiv](#)]
12. Zou, B. and Cadenillas, A., 2017. Optimal investment and liability ratio policies in a multidimensional regime switching model. *Risks*, 5(1), 6. [[Journal](#)] [[PDF](#)]
13. Zou, B. and Cadenillas, A., 2014. Explicit solutions of optimal consumption, investment and insurance problems with regime switching. *Insurance: Mathematics and Economics*, 58, 159-167. [[Journal](#)] [[arXiv](#)]
14. Zou, B. and Cadenillas, A., 2014. Optimal investment and risk control policies for an insurer: expected utility maximization. *Insurance: Mathematics and Economics*, 58, 57-67. [[Journal](#)] [[arXiv](#)]
15. Zou, B. and Yang, G., 2008. Optimal hedging strategy of futures. *Journal of Beijing Institute of Technology*, Vol.17 (Suppl), 188-191. [[PDF](#)] (based on my bachelor's thesis)

## Submitted and Working Papers

- Shen, Y. and Zou, B., 2021. Mean-variance portfolio selection in contagious markets. *Revised and Resubmitted*. [[PDF](#)]
- Jin, Z., Xu, Z.Q., and Zou, B., 2021. A perturbation approach to optimal investment, liability ratio, and dividend strategies. *Revised and Resubmitted*. [[PDF](#)] [[arXiv](#)]
- Wang, G. and Zou, B., 2021. Optimal Fee Structure of Variable Annuities. [[SSRN](#)]
- Alexander, C., Deng, J., and Zou, B., 2021. Margin constraints, default aversion, and optimal hedging in bitcoin futures markets. [[PDF](#)] [[SSRN](#)]
- Fan, K., Shen, Y., Wei, J., and Zou, B., 2020. Monotone mean-variance portfolio selection under non-Markovian regime-switching models. [[PDF](#)]
- Deng, J., Pan, H., Zhang, S., and Zou, B., 2020. Mean-variance tradeoff of bitcoin inverse futures. [[PDF](#)]

## Inactive Working Paper and Technical Notes

- Deng, J., Pan, H., Zhang, S., and Zou, B., 2019. Risk structure of bitcoin inverse futures and optimal hedging. [[SSRN](#)] [[PDF](#)]
- Zou, B. and Cadenillas, A., 2013. Optimal consumption, investment and insurance problem in infinite time horizon. [[PDF](#)].
- Zou, B., 2018. Lecture notes on Portfolio Optimization and Management, University of Connecticut. [[PDF](#)]
- Zou, B., 2015. Stochastic Control in Optimal Insurance and Investment with Regime Switching. Ph.D. thesis, University of Alberta, Canada. [[DOI](#)] [[PDF](#)]
- Zou, B., 2014. Introduction to Statistics. Lecture slides for STAT 141/151, University of Alberta. [[PDF](#)].
- Zou, B., 2010 Fall. Notes on Corporate Finance, University of Alberta. [[PDF](#)].

## Teaching Experience

- Instructor at the University of Connecticut
  1. MATH 2620 *Financial Mathematics I*: 2020 Fall, 2021 Spring
  2. MATH 3640 *Short-term Insurance Ratemaking*: 2019 Fall
  3. MATH 5640 *Short-term Insurance Ratemaking*: 2019 Spring, 2020 Spring
  4. MATH 5639 *Actuarial Loss Models*: 2018 Fall, 2019 Fall, 2020 Fall
  5. MATH 5800 *Portfolio Optimization and Management*: 2018 Spring
  6. MATH 5640 *Advanced Topics in Actuarial Mathematics I*: 2017 Fall
- Instructor at the Southern University of Science and Technology, Shenzhen, China  
MAS 220 *Portfolio Optimization and Management*: 2018 Summer (July)
- Instructor at the University of Washington
  1. CFRM 461 *Probability and Statistics for Computational Finance*: 2017 Spring
  2. CFRM 543 *Portfolio Optimization and Asset Management*: 2017 Spring
  3. CFRM 558 *Fixed Income Analytics and Portfolio Management*: 2017 Winter
- Instructor at the University of Alberta
  1. STAT 141 *Introduction to Statistics*: 2015 Winter
  2. STAT 151 *Introduction to Applied Statistics I*: 2014 Summer

## Selected Honors and Awards

- SIAM Travel Award, Society for Industrial and Applied Mathematics, 5/2021
- Scholarship Facilitation Fund, University of Connecticut, 9/2019 - 4/2020
- OVPR/AAUP Travel Award, University of Connecticut, 11/2018 (declined); 10/2019
- Teaching Excellence Recognition, University of Connecticut  
2017 Fall; 2018 Fall; 2019 Spring; 2019 Fall; 2020 Fall
- Travel Award, Centre De Recherches Mathématiques (CRM), Montreal, Canada, 9/2017
- Start-up Grant, University of Connecticut, 8/2017 - 8/2022
- TUM Foundation Fellowship, Technical University of Munich, 5/2015 - 4/2016
- SIAM Travel Award, Society for Industrial and Applied Mathematics, 11/2014
- GSA Professional Development Award, University of Alberta, 2014
- Profiling Alberta's Graduate Students Award, University of Alberta, 2014
- J. M. Mitchell Graduate Scholarship, University of Alberta, summer 2011
- Eoin L. Whitney Scholarship, University of Alberta, 2010
- Teaching and Research Assistantship, University of Alberta, 9/2019 - 12/2014
- University Dissertation Award, Beijing Institute of Technology, 7/2009
- National Graduate Student Fellowship, Beijing Institute of Technology, 9/2007 - 6/2009
- First-class University Fellowship, Beijing Institute of Technology, 2004 - 2005

## Research Grants

- Project: Hedging and Trading with Bitcoin Inverse Futures  
Agency/Company: Mitacs Globalink Research Award, Canada  
Role: Faculty Advisor, Total Dollar Amount: \$6,000 (CAD), 5-7/2020 (postponed due to Covid19)  
Student: Sijiao Liu (master student, Ryerson University, Canada)
- Project: Dynamic Retirement Financial Planning using MYGA's  
Agency/Company: Actuarial Innovation Services (AIS), private industry  
Role: PI, Total Dollar Amount: \$5,000, 10/2019 - 1/2020

## Invited Conference and Seminar Talks

Remarks. The symbol [★] indicates financial support from the organizers, host institution or internal award. All the talks given between April 2020 and now are delivered in virtual format.

### 2021 (9 invited talks and 1 invited discussion)

1. July 19-23, SIAM Annual Meeting, Spokane, Washington, USA  
Talk: A Perturbation Approach to Optimal Investment, Liability Ratio, and Dividend Strategies
2. June 1-4, SIAM Conference on Financial Mathematics & Engineering, Philadelphia, Pennsylvania, USA  
Talk: A Perturbation Approach to Optimal Investment, Liability Ratio, and Dividend Strategies
3. April 21, Mathematics Colloquium, Department of Mathematical Sciences, University of Wisconsin-Milwaukee, USA  
Talk: Mean-Variance Portfolio Selection in Contagious Markets
4. March 20, AMS Spring Eastern Sectional Meeting, Brown University, USA  
Talk: Optimal Hedging with Margin Constraints and Default Aversion and its Application to Bitcoin Perpetual Futures
5. March 19, Actuarial Science Seminar, Department of Actuarial Science (DAS), Faculty of Business and Economics (HEC), University of Lausanne, Switzerland  
Talk: Two Special Techniques in Optimal Control with Applications in Insurance
6. March 17, Applied Mathematics Colloquium, Department of Applied Mathematics, Hong Kong Polytechnic University, China  
Talk: Optimal Bookmaking
7. March 13, 7th Asian Quantitative Finance Seminar, Peking University HSBC Business School, China  
Discussion on "From Hotelling to Nakamoto: The Economics of Bitcoin Mining"
8. March 9, Actuarial Research Seminar, School of Risk & Actuarial Studies, University of New South Wales (UNSW), Australia  
Talk: Optimal Hedging with Margin Constraints and Default Aversion and its Application to Bitcoin Perpetual Futures
9. March 5, Actuarial and Financial Mathematics Research Seminar, Quantact Actuarial and Financial Mathematics Laboratory, Montreal, Canada  
Talk: Two Special Techniques in Optimal Control with Applications in Insurance
10. January 8, Joint Mathematics Meeting, USA  
Talk: Mean-Variance Portfolio Selection in Contagious Markets

### 2020 (6 invited talks and 1 invited discussion, plus 2 canceled)

1. Dec. 15, 5th Asian Quantitative Finance Seminar, Questrom School of Business, Boston University, USA  
Talk: Margin Constraints, Default Aversion, and Optimal Hedging in Bitcoin Futures Markets

2. (same as above) Discussion on “Optimizing Distortion Riskmetrics with Distributional Uncertainty”
3. Nov. 19, Financial Mathematics Seminar, Department of Mathematics, Florida State University, USA  
Talk: Mean-Variance Investment and Risk Control Strategies
4. Oct. 22, Financial Mathematics Seminar, Department of Mathematical Sciences, Worcester Polytechnic Institute, USA  
Talk: Margin Constraints, Default Aversion, and Optimal Hedging in Bitcoin Futures Markets
5. Sep. 13, AMS Central Fall Sectional Meeting, University of Texas at El Paso, USA  
Talk: Minimum-Variance Hedging of Bitcoin Inverse Futures
6. Aug. 10, Actuarial Research Conference, University of Nebraska-Lincoln Business School, USA  
Talk: Mean-Variance Investment and Risk Control – A New Time-Consistent Formulation
7. [★] April 9, Finance and Risk Engineering Seminar, Tandon School of Engineering, New York University, USA (*canceled due to COVID-19*)
8. [★] March 27, Mathematics Colloquium, Department of Mathematics and Statistics, Georgia State University, USA (*canceled due to COVID-19*)
9. [★] March 9, Mathematical Finance Colloquium, Department of Mathematics, University of Southern California, USA  
Talk: A Set-valued Markov Chain Approach to Credit Default

**2019 (5 invited talks)**

1. [★] Nov. 13, Financial Mathematics Seminar, Department of Mathematics, University of Michigan, Ann Arbor, USA  
Talk: Optimal Bookmaking
2. [★] Oct. 22, Stochastic Processes and Finance Session, INFORMS Annual Meeting, Seattle, USA  
Talk: A Set-valued Markov Chain Approach To Credit Default
3. Oct. 7, Actuarial Science Seminar, Department of Mathematics, University of Connecticut, USA  
Talk: Introduction to Bitcoin Inverse Futures
4. [★] Sep. 24, Mathematical Finance and Probability Seminar, Department of Mathematics, Rutgers University, New Brunswick, USA  
Talk: Optimal Bookmaking
5. June 7, SIAM Conference on Financial Mathematics & Engineering, University of Toronto, Canada  
Talk: A Mathematical Analysis of Technical Analysis

**2018 (2 invited talks)**

1. [★] July 5, Research Seminar, College of Mathematics and Statistics, Shenzhen University, Shenzhen, China  
Talk: Systemic Risk and Optimal Design of Central Clearing Counterparty
2. [★] May 14, Finance Seminar, School of Banking and Finance University of International Business and Economics, Beijing, China  
Talk: Systemic Risk and Optimal Design of Central Clearing Counterparty

**2017 (4 invited talks)**

1. [★] Dec. 21, Financial Mathematics Seminar, Department of Mathematics, Southern University of Science and Technology, Shenzhen, China  
Talk: Systemic Risk and Optimal Design of Central Clearing Counterparty
2. [★] Nov. 23, Mathematics Seminar, Department of Mathematics, Ryerson University, Toronto, Canada  
Talk: Systemic Risk and Optimal Design of Central Clearing Counterparty

3. Nov. 1, Statistics Colloquium, Department of Statistics, University of Connecticut, USA  
Talk: Optimal Investment with Transaction Costs under Cumulative Prospect Theory in Discrete Time
4. [★] July 7, Finance Seminar, School of Banking of Finance, University of International Business and Economics, Beijing, China  
Talk: Introduction to Cumulative Prospect Theory with Applications

**2016 (10 invited talks)**

1. [★] Dec. 20, Research Seminar, School of Mathematics, South China University of Technology, China  
Talk: Introduction to Cumulative Prospect Theory with Applications
2. [★] Nov. 17, SIAM Conference on Financial Mathematics & Engineering, Austin, Texas, USA  
Talk 1: Optimal Investment in Hedge Funds under Loss Aversion  
Talk 2: Optimal Investment with Transaction Costs under Cumulative Prospect Theory in Discrete Time
3. Oct. 13, Research Seminar, Department of Applied Mathematics, University of Washington, USA  
Talk: Introduction to Cumulative Prospect Theory and Its Application in Hedge Fund Management
4. [★] Jun. 5, Research Seminar, Department of Mathematics and Statistics, University of Calgary, Canada  
Talk: Optimization under Cumulative Prospect Theory: Introduction and Applications
5. [★] Mar. 24, Actuarial Science Seminar, Department of Statistics and Actuarial Science, Simon Fraser University, Canada  
Talk: Optimization under Cumulative Prospect Theory: Introduction and Applications
6. [★] Feb. 15, Mathematics Seminar, Department of Mathematics, University of Central Florida, Orlando, USA  
Talk: Stochastic Control in Optimal Insurance and Investment
7. [★] Feb. 11, Mathematics Seminar, Department of Mathematics, University of Connecticut, Storrs, USA  
Talk: Stochastic Control in Optimal Insurance and Investment
8. [★] Jan. 25, Research Seminar, Department of Banking and Finance, University of Zurich, Switzerland  
Talk: Optimal Investment in Hedge Funds under Loss Aversion
9. [★] Jan. 18, Mathematics Seminar, School of Mathematical and Computational Sciences, University of Prince Edward Island, Canada  
Talk: Introduction to Markov Chains

**2011 - 2015 (4 invited talks)**

1. [★] Jun. 20, 2015, Mathematics Research Communities, Snowbird Resort, Utah, USA  
Talk: Optimal Investment and Consumption with Multiple Stocks and Transaction Costs
2. [★] Dec. 11, 2014, Actuarial Science Seminar, Department of Statistics and Actuarial Science, University of Waterloo, Canada  
Talk: Stochastic Control in Optimal Insurance and Investment
3. [★] Oct. 23, 2014, Research Opportunities Week, Technical University of Munich, Munich, Germany  
Talk: Optimal Consumption, Investment and Insurance Policies with Regime Switching
4. Oct. 19, 2011, Graduate Student Colloquium, University of Alberta, Canada  
Talk: A Brief Introduction to Mathematical Finance

## Contributed Conference Talks

1. May 13, 2018, PKU-NUS Annual Conference on Quantitative Finance and Economics, Peking University, China  
Talk: A Mathematical Analysis of Technical Analysis
2. [★] Aug. 6, 2015, World Risk and Insurance Economics Congress, University of Munich, Germany  
Talk: Optimal Investment and Liability Ratio Policies in a Multidimensional Regime Switching Model
3. [★] Nov. 15, 2014, SIAM Conference on Financial Mathematics & Engineering, Chicago, U.S.A.  
Talk: Optimal Investment and Risk Control Policies for an Insurer
4. [★] July 11, 2014, International Congress on Insurance: Mathematics and Economics, Shanghai, China  
Talk: Optimal Investment and Risk Control Policies for an Insurer
5. [★] Sep. 24, 2013, Workshop on Optimization in Finance and Risk Management, Fields Institute, Canada  
Talk: Explicit Solutions of Optimal Consumption, Investment and Insurance Problems
6. [★] Jun. 26, 2012, PIMS Young Researchers Conference, University of Calgary, Canada  
Talk: Optimal Investment, Consumption and Insurance Problem

## Conferences and Workshops Participated

- [★] 6/10-13/2019, Rutgers Equilibrium Theory Summer School & Workshop, Rutgers University, USA
- 11/3-5/2017, 2nd Eastern Conference on Mathematical Finance, Columbia and NYU, USA
- [★] 9/26-28/2017, Workshop on Measurement and Control of Systemic Risk, Centre De Recherches Mathématiques (CRM), Montreal, Canada
- 9/16/2017, BU Conference on Financial Econometrics, Metro Meeting Center, Boston, USA
- 3/24-25/2017, 8th Western Conference in Mathematical Finance, University of Washington, Seattle, USA
- [★] 10/8-9/2015, Workshop on Frontiers in Risk Management, Ulm University, Reisingen, Germany
- [★] 8/31-9/4/2015, European Summer School in Financial Mathematics, University of Maine, France
- [★] 6/14-20/2015, Mathematics Research Communities on Financial Mathematics, Snowbird Resort, USA
- [★] 6/7-7/9/2010, MITACS-PIMS-UBC Summer Workshop in Risk Management and Risk Sharing, University of British Columbia, Vancouver, Canada

## Organizing Activities

- 9/2020 - Now, organizer of the [Control and Optimization Seminar](#), Department of Mathematics, University of Connecticut
- 9/2019 - Now organizer and 9/2017 - 4/2019 co-organizer of the [Actuarial Science Seminar](#), Department of Mathematics, University of Connecticut, USA
- 6/1-4/2021, organizer of Session *Mathematical and Statistical Methods of Risk and Insurance* (8 speakers), [SIAM Conference on Financial Mathematics & Engineering](#), Philadelphia, USA
- 3/20-21/2021, co-organizer of Session *New Applications and Methods in Financial Mathematics* (10 speakers), [AMS Spring Eastern Sectional Meeting](#) (formerly at Brown University)
- 12/9/2019, co-organizer of Session *Stochastic Control Methods in Finance and Economics* (9 speakers), [Canadian Mathematics Society \(CMS\) Winter Meeting](#), Toronto, Canada
- 6/6/2019, organizer of Session MS33 *Portfolio Selection Driven by Behavioral Finance Studies* (4 speakers), [SIAM Conference on Financial Mathematics & Engineering](#), University of Toronto, Canada

- 4/13/2019, co-organizer of Session *Mathematical Finance* (10 speakers), [AMS Spring Eastern Sectional Meeting](#), University of Connecticut (Hartford Campus), Hartford, USA

## Committee and Supervision

- Associate Advisor of Banghee So, Ph.D. candidate, University of Connecticut  
Thesis: Actuarial Models for Understanding Driver Behavior with Telematics Data
- External Examiner of Jiacheng Fan, Ph.D., Stevens Institute of Technology, defended on 8/3/2020  
Thesis: Optimal Investment Problem in Finance
- Associate Advisor of SangJoon Lee, Ph.D., University of Connecticut, defended on 11/11/2019  
Thesis: Asymptotic Analysis of Quasi-limiting Behavior for Drifted Brownian Motion Conditioned to Stay Positive
- Associate Advisor of Qintian Sun, Ph.D., University of Connecticut, defended on 6/17/2019  
Thesis: Dynamic Retirement Financial Planning Model

## Professional Services

Adhoc Referees for: Accounting and Finance; Applied Mathematical Finance; ASTIN Bulletin; European Actuarial Journal; Communications in Statistics–Theory and Methods; European Journal of Finance; Journal of Banking and Finance; International Journal of Theoretical & Applied Finance; Insurance: Mathematics and Economics; Mathematics and Financial Economics; Mathematics of Operations Research; Operations Research; Risks; Scandinavian Actuarial Journal; SIAM Journal on Financial Mathematics

## Society of Actuaries (SOA) Exams Passed

Statistics for Risk Modeling (SRM); Short-Term Actuarial Mathematics (STAM); Investment and Financial Markets (IFM); Financial Mathematics (FM); Probability (P)  
VEE: Accounting and Finance; Mathematical Statistics; Economics

Last updated: May 19, 2021