Michael Boyuan Zhu

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Education

Ph.D. Candidate – Actuarial Science, University of Waterloo — September 2020 – Present

- Supervisor: Dr. Mario Ghossoub

Master of Mathematics – Actuarial Science, University of Waterloo — September 2019 – September 2020

- Supervisor: Dr. Mario Ghossoub
- Completed Thesis: Cost Efficient Contingent Claims with Choquet Pricing
- Cumulative average: 96%

Exchange Student – Computer Science, ETH Zürich — September 2016 – February 2017

Honours Bachelor of Mathematics, University of Waterloo — September 2013 – December 2018

- Mathematical Finance, Computer Science Minor
- Graduation with Distinction

Research Interests

Actuarial science, quantitative risk management,
game theory, ambiguity and risk uncertainty, behavioral finance

Publications and Manuscripts

Peer-reviewed journal articles

1. **Stackelberg Equilibria with Multiple Policyholders** (with Mario Ghossoub). *Insurance: Mathematics and Economics*, forthcoming. [SSRN]
2. **Equilibria and Efficiency in a Reinsurance Market** (with Tim Boonen, Mario Ghossoub). *Insurance: Mathematics and Economics*, 113(1):24-49, 2023. [ ]
3. **Pareto-Optimal Insurance with an Upper Limit on the Insurer's Exposure** (with Oma Coke, Mario Ghossoub). *Scandinavian Actuarial Journal*, forthcoming. [ ]

Pre-publication manuscripts and working papers

1. **Risk-Constrained Portfolio Choice via Quantiles** (with Mario Ghossoub). *Revision (second round), Finance and Stochastics.* [SSRN]
2. **Efficiency in Pure-Exchange Economies with Schur-Concave Utilities** (with Mario Ghossoub). *Working paper.*
3. **Loss Aversion for Decision under Risk** (with Mario Ghossoub). *Working paper.*

Academic Presentations

1. **Equilibria and Efficiency in a Reinsurance Market** – 26th International Congress on Insurance: Mathematics and Economics (Jul. 2023)
2. **Insurance with Heterogeneous Beliefs: A Sequential Game Model** – Waterloo 3rd Student Conference in Statistics, Actuarial Science, and Finance (Oct. 2022)
3. **Risk Sharing with Heterogeneous Beliefs** – University of Amsterdam (Jun. 2022)
4. **Risk-Constrained Portfolio Choice via Quantiles** – Waterloo 2nd Student Conference in Statistics, Actuarial Science, and Finance (Nov. 2021), 56th Actuarial Research Conference (Aug. 2021), 24th International Congress on Insurance: Mathematics and Economics (Jul. 2021)
5. **Cost-Efficient Contingent Claims with Choquet Pricing** – Canadian Operational Research Society Annual Conference (Jun. 2021), University of Waterloo Statistics and Actuarial Science Presentation Day (Feb. 2021)

Professional Service

Conference Co-Chair – 4th WSSAF — October 27-28, 2023

- One of two student organizers in charge of the 4th Waterloo Student Conference in Statistics, Actuarial Science and Finance. Duties included contacting external speakers, managing volunteers, event logistics, etc.

Research Mentor – Women in Mathematics (WiM) Directed Reading Program — January – April 2023

- Mentored a female undergraduate student from the Faculty of Mathematics as part of the WiM Directed Reading Program. Focused on the topic of economic equilibria from mathematical economics.

Conference Volunteer, Session Chair – 2nd, 3rd WSSAF — October 2021, 2022

- Assisted with the 2nd and 3rd editions of the Waterloo Student Conference in Statistics, Actuarial Science and Finance. Reviewed abstracts and served as session chair.

Peer-Review Service

- ASTIN Bulletin.

Teaching Experience

Sessional Instructor, University of Waterloo

- ACTSC 446/846 – Introduction into Financial Mathematics — Fall 2023

Teaching Assistant, University of Waterloo

- ACTSC 971 – Finance 2 — Winter 2021
- ACTSC 446/846 – Introduction into Financial Mathematics — Winter 2020/2023, Spring 2020, Fall 2020/2021
- ACTSC 445/845 – Quantitative Enterprise Risk Management — Spring 2021
- ACTSC 631 – Financial Mathematics III — Spring 2020/2021/2022/2023
- ACTSC 633 – Actuarial Risk Management — Spring 2022
- ACTSC 634 – Quantitative Risk Management — Spring 2020/2021/2023
- ACTSC 635 – Professional Communications in Actuarial Science — Spring 2022
- ACTSC 372 – Corporate Finance — Winter 2021/2022
- STAT 333 – Applied Probability — Fall 2019/2020
- STAT 231 – Statistics — Fall 2019

Selected Honors and Awards

- James C. Hickman Scholar – SOA — May 2022
- D.A. Sprott Entrance Award – University of Waterloo — September 2020
- Actuarial Science Doctoral Entrance Award – University of Waterloo — September 2020
- NSERC Undergraduate Student Research Award — January 2016
- Top 350 (of 4275) in the Putnam Mathematical Competition — December 2015
- President's Scholarship – University of Waterloo — September 2013
- Placed 30th nationally in the Canadian Mathematical Olympiad — April 2012

Work Experience

Research Assistant – Actuarial Science — January – March 2019
University of Waterloo – Waterloo, ON

- Investigated a problem of loss aversion for decision under risk
- Actuarial science, behavioural economics, and quantitative finance

Undergraduate Research Assistant – Pure Mathematics — January – April 2016
University of Waterloo – Waterloo, ON

- Investigated bounds in the theory of polynomial rings over fields
- Model theory, commutative algebra, and nonstandard analysis

Software Engineer Intern — May – August 2015
Wish – San Francisco, CA

Application Analyst — April – August 2014
National Bank Financial – Toronto, ON

Other Skills

Technical	Programming: Python, C/C++, Java, Shell Scripting, Scheme/Racket, HTML/Javascript Data/statistics: MATLAB, R, Maple, Microsoft Excel Tools: LaTeX, Unix, Git, MongoDB, Hive
Actuarial	Exams passed: P, FM, IFM, STAM, SRM, FAM-L, PA

Last updated: Feb. 2024