Yawen Zhang

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EDUCATION

Elizabethtown College, Elizabethtown, PA
Department of Mathematical Sciences Jan. 2017 – Dec. 2020 (Anticipated)

- B.S. in **Actuarial Science** Major GPA: 3.62/4.00 (grade ranking: #2)
- Honors & Awards: Outstanding Senior Student in Math Department 2020 (one student per year)
  Dean's List 2020 & 2019, Honors-in-the-Discipline in Mathematics 2020
  Pi Mu Epsilon, Pennsylvania Pi Chapter Award, 2019
  Interviewed by Advisor Smith as the leader student in Insurance, 2020
- **Relevant Courses**: Mathematical Statistics (96), Statistical Methods in Research (97), Theory of Probability (90), Operations Research (92), Mathematical Proofs (94), Financial Mathematics (91), Linear Algebra & Machine Learning
- Study abroad at the University of Granada, Spain (Sep. 2019 – Dec. 2019*)*

PAPER

Yawen Zhang, *A purely 3-D geometrical solution to a complicated probability problem* (Under Review)
Yawen Zhang, Timothy McDevitt, *Playing to not lose instead of playing to win* (preparing)

RESEARCH EXPERIENCE

Research Assistant | Elizabethtown College | Elizabethtown, PA Aug. 2020 – Present
Project: **Game Theory - Equilibrium Problem in Multiple-Strategy Game**
Supervisor: Dr. Timothy McDevitt, Professor of Mathematical and Computer Sciences at Elizabethtown College

- Proved that Nash equilibrium makes the conservative players, who accept ties in two strategy games, more likely to win, compared to the aggressive players who think winning is everything, and illustrated that the phenomenon is transferable and robust in three non-zero-sum strategy games
- Calculated the probability of conservative players winning over aggressive players in two strategy games, and used matrix derivatives and linear programming to analyze multiple-strategy games and empirically demonstrated that the probability goes down as the number of strategies increases
- Used Mathematica to write a program based on Markov chain to simplify the probability metrices in Penney' game, and generalized this application numerally and symbolically, and found it align with the phenomenon
- Discovered the appearance of the golden ratio in two-coin game, and offer a geometric rationale for it (on going)

TEACHING

Teaching Assistant | Elizabethtown College | Elizabethtown, PA Apr. 2018 – May. 2019

- Provided review sessions to students for courses Financial Mathematics and Introduction to Mathematical Proofs and was awarded the Best Tutor in Math Department 2019 (one student per year)

PROFESSIONAL EXPERIENCE

Actuarial Pricing intern | **AXA**, P&C and specialty risk division | New York City, NY Jun. 2020 – Aug. 2020

- Researched the Predictive Analytics Models and Algorithms in insurance using R markdown
- Developed machine learning models (XGBoost, Random Forest) to predict the loss ratio for Property and Marine insurance and improved the accuracy by 5%, compared with the previously used model (GLM)
- Built an interactive dashboard for leadership team using R Shiny and taught colleagues how to build dashboards
- Supported the underwriting team by providing metrics reports and creating excel templates for surcharge calculations

Wealth Actuarial Intern | **Mercer** | Philadelphia, PA Jun. 2019 – Aug. 2019

- Implemented data gathering, data cleaning, and exploratory data to complete a mock valuation using a highly integrated software *Retirement Studio* and made a 20-page valuation report for the client to review
- Used longevity models and mortality probabilities to design Retirement Plan Changes and made graphs to visualize how the changes (from pension to 401K) benefited the clients
- Analyzed the investment portfolio and performed a case study around investment ideas
- Researched and presented about the Future Transformation of Retirement Plans, and 50+ colleagues attended

SKILLS

Computer Skills: R, Python, SQL, VBA, SAS, Mathematica, Java, Markdown and Latex