

# Yawen Zhang

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## EDUCATION

Elizabethtown College, Elizabethtown, PA  
(Anticipated)

Jan. 2017 – Dec. 2020

Department of Mathematical Sciences

- B.S. in Actuarial Science, Major GPA: 3.62/4.00 (grade ranking #2)
- Honors & Awards: Dean's List 2020 & 2019, Honors-in-the-Discipline in Mathematics 2020  
Outstanding Senior Student in Math Department 2020 (one student per year)  
Interviewed by AdvisorSmith as the leader student in Insurance, 2020  
Pi Mu Epsilon, Pennsylvania Pi Chapter Award, 2019
- **Related Courses:** Mathematical Statistics, Statistical Methods in Research, Theory of Probability, Operations Research, Mathematical Proofs, Financial Mathematics, Linear Algebra, and Machine Learning(R)
- Study aboard 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)

## RESEARCH

**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 strategies games more likely to win, compare to the aggressive plays who think winning is everything, and illustrated that the phenomenon is transferable and robust in three strategies non-zero-sum games
- Calculated the probability that conservative players winning over aggressive players in two strategies games, and empirically demonstrated that the probability for conservative plays to win goes down while the number of strategies gets bigger
- Used Karush–Kuhn–Tucker (KKT), matrix derivatives and linear programming to analyze the mixed strategies in multiple-strategy games, and prove the probability converges to 1/2 (ongoing)
- Read economic literatures to find a practical application that works with the phenomenon

## TEACHING

**Teaching Assistant** | Elizabethtown College | Elizabethtown, PA

Apr. 2018 – May. 2019

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

## EMPLOYMENT

**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
- Interviewed 20+ colleagues across business functions to gain a comprehensive understanding of how the company works

**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
- Analyze 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