

Middle Tennessee State University

Actuarial Science Program Newsletter (Fall 2023)

Presented by the Actuarial Mathematics Student Association (AMSA)

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Faculty

Dr. Don Hong
Dr. Abdul Khaliq
Dr. Vajira Manathunga
Dr. Qiang Wu, ASA
Dr. Lu Xiong, ASA



CAS University
Recognition Program
Gold Level

MTSU Actuarial Science

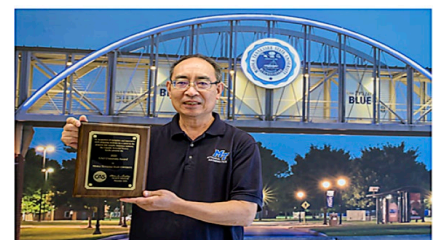
Letter from Program Coordinator

During the season of Thanksgiving, I am proud to celebrate the tremendous accolade that the MTSU Actuarial Science program was recently bestowed: the Gold Level Recognition from the Casualty Actuarial Society (CAS). Following the honor of the 2020 CAS University Award, I sincerely congratulate and appreciate all of you: students, colleagues, administrators, as well as industry partners who have contributed significant efforts to reach this huge milestone in the program's success.

Actuarial science is a special discipline that trains students to apply math knowledge, statistical techniques, and data science skills to manage risk and solve problems in insurance, financial investment, and pension programs. The occupation of actuary has been ranked one of the best jobs based on a variety of factors for many years. As a Center of Actuarial Excellence (CAE) candidate school of the Society of Actuaries (SOA), the MTSU Actuarial Science program continues to grow and produce highly qualified actuarial professionals. In 2024, the 59th Actuarial Research Conference (ARC2024) will be held on MTSU campus from July 18-20. We are grateful for your support and look forward to seeing you at the meeting. As the semester end nears and holidays approach, I wish you all a very Happy Holiday Season! Sincerely, Don Hong

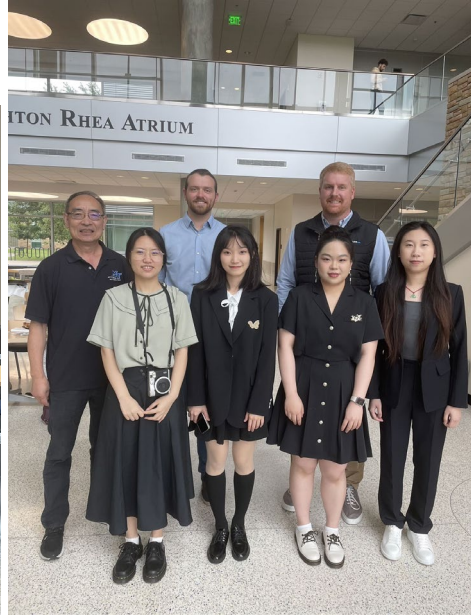
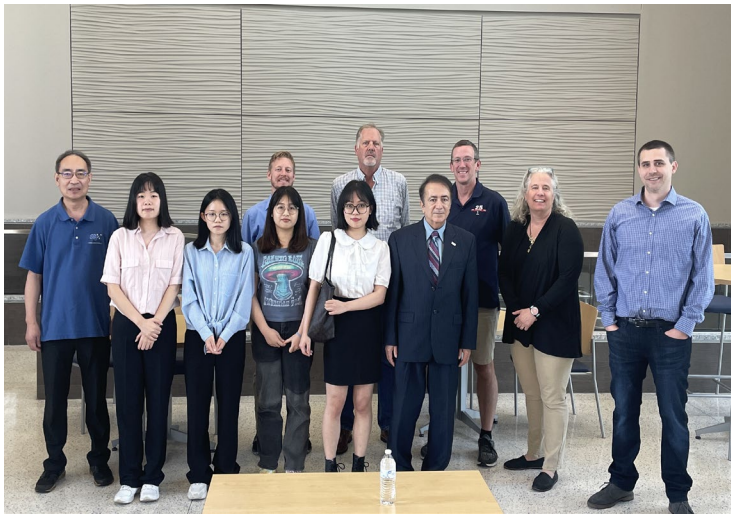
Program Facts

- The MTSU Actuarial Science program was established in 1987. The concentration in actuarial science for the MS degree of Professional Sciences (MSPS) was established in 2010. Based on the successes under the concentration in actuarial science of BS in Mathematics, the stand-alone BS degree in Actuarial Science was established in 2015. MTSU is the only school in Tennessee that offers actuarial science coursework for both undergraduate and graduate programs.
 - The Actuarial Math Student Association (AMSA) was established in 2005. The advisory board for the program was set up in the same year. AMSA hosts professional speakers for student activities regularly.
 - MTSU Actuarial Science program received the 2020 University Award from the Casualty Actuarial Society (CAS) and was bestowed a Gold Level Recognition by the CAS recently in November 2023. MTSU Actuarial Science program is a UCAP-AC school recognized by the Society of Actuaries (SOA).
 - MTSU MS programs for actuarial science studies has attracted students from Dartmouth, Notre Dame, UC-Berkeley, UCLA, UIUC, UT-Knoxville, U Alabama, Washington University at St. Louis and from all over the US as well as other countries including Bangladesh, Cameron, China, Ghana, India, Kenya, South Korea, Saudi Arabia, and Thailand among others.
- MTSU graduates from the BS in Actuarial Science program recently received graduate school admission offers from Amsterdam, Boston, Columbia, Connecticut, Connell, NYU, Ohio State, South California, Toronto, UIUC, Wisconsin-Madison, Waterloo, etc.
- So far, over 40 MTSU actuarial alumni achieved ASA/ACAS or FSA/FCAS designations.



Program News

■ 17 students graduated in actuarial science program with an MS degree from August 2022 to August 2023 after completing a capstone internship. **In the left picture below**, the program advisory board members and industry partners, Michelle Brandley (L2), ACAS and Tony King (L3) from SIGMA Actuarial Consulting, Richard Waggoner (L5), FSA from Aetna, and David Craig (R4 behind), ASA from Blue Cross & Blue Shield of Tennessee and faculty members Dr. Don Hong (R1), Director of Actuarial Science program, and Dr. Saeed Foroudastan (L4), Associate Dean of the CBAS and Director of the MSPS program were with students after their internship presentation in August 2022. . **In the right picture below**, the program advisory board members and industry partners, Nathan Cohee, FSA, and Brennan Stader from Fortitude Re. at Nashville, TN, supervised students' summer internships in 2023.



■ 23 actuarial students graduated with a BS degree in May 2023. Many of them continued graduate studies in the fields of actuarial science, data science, financial math, insurance & risk management, or statistics at prestigious schools in the US, Canada, or UK.



■ Ph.D. student, Shuzhe Xu graduated in December 2021, completed a dissertation entitled APPLICATIONS OF MODERN NLP TECHNIQUES FOR PREDICTIVE MODELING IN ACTUARIAL SCIENCE. His dissertation committee consisted of Drs. Don Hong (Chair), Sal Barbosa (Co-Chair), Vajira Manathunga, Zachary Sinkala, and Qiang Wu.

■ Invited and arranged by Tom Swain, FSA, a member of the program advisory board, MTSU actuarial faculty members and students attended the annual meeting of the conference of consulting actuaries (CCA) held at Nashville, TN from October 16-18, 2023.

AMSA Meetings

- Adam French (MSPS, 12/2015), Senior Actuarial Analyst, and Paul Dowell (BS 2020, MSPS 2022), Actuarial Analyst at Barrett Business Services (BBSI) spoke to actuarial students on March 30, 2023. (Picture on left below). AMSA members were invited to attend the Cigna Group's Aspiring Actuaries Day on April 14th, 2023. On 4/19/2023, Gary Gau, VP of Actuarial Services and Data Science at PopHealthCare & Emcara, and his colleague spoke to actuarial students at KOM.
- Nathan Cohee and Brennan Stader from Fortitude Re. spoke and interviewed our students on 9/29/2023. Stephanie Cope, APIR, Director of Policy Analysis, and Zachary Crandall from Tennessee Department of Commerce and Insurance spoke to actuarial science students on October 27, 2023 (Center picture below).



- L. Michelle Bradley, Tony King, and Emma Ward from SIGMA Actuarial Consulting Group, Inc. visited MTSU campus to speak with actuarial students on the topic of, "Stochastic Modeling – An Introduction to Loss Simulations". We appreciate the long time partnership with SIGMA and strong support from them.

News from Alumni

Congratulations to MTSU actuarial alumni who have achieved ASA/ACAS, CERA, or FSA/FCAS designations during 2022-2023:

Curtis Barker (MS 2019), **ASA**; Brent Carpenetti (BS 2011, MS 2017), **FSA**; Adam Caskey (BS 2017), **ASA**; Wenqi Chen (BS 2016), **FSA**; Zhangyao Chen (BS 2016), **ASA**; Ryan Clark (BS 2018), **ASA, CERA**; Nathan Patrick Cohee (MS 2015), **FSA**; Courtney S. DeClerk (MS 2019), **ASA**; Daniel Keith Duggin (BS 2005), **FSA**; Holden French (MS 2018), **ASA**; David J. Jesik (BS 2011), **FSA**; Brent Osantowski (MS 2012), **FSA**; Donaldson M. Peay (MS 2017), **FCAS**; Ying Peng (MS 2013), **ASA**; David Patrick Phillips (MS 2015), **ASA**; Jack A. Pipa (BS 2007), **FCAS**; Jianxu Xu (BS 2018), **ASA**; Xiufeng Yin (BS 2009), **FSA**.

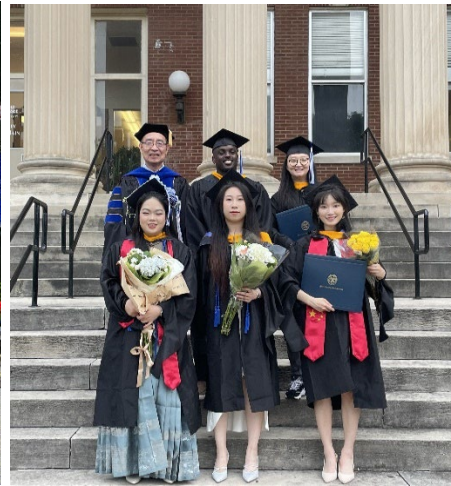
Faculty News:

* All faculty members in the actuarial science program: Drs. Don Hong, Abdul Khaliq, Vajira Manathunga, Qiang Wu, and Lu Xiong, are actively involved in teaching and/or student dissertation research supervision in the Computational & Data Science Ph.D. program. Drs. Don Hong, Abdul Khaliq, and Qiang Wu have directed **eighteen** (18) Ph.D. dissertations since 2010, **seven** (7) of them were completed from December 2021-August 2023.



Above picture on left: Drs. Don Hong (L) and Vajira Manathunga (R) pictured with Shuzhe Xu (Ph.D., 12/2021).

Above picture on right: Drs. Qiang Wu, Joshua Phillips, Don Hong (Chair), John Wallin, and Lu Xiong served in the Dissertation committee and pictured together after Dissertation defense of Gabriel Toban (L3) (Ph.D., May 2023)



Above Picture on left: Drs. Abdul Khaliq (L2) and Don Hong (c) with their Ph.D. graduates at the December 2021 commencement. **Above Picture on right:** Dr. Don Hong was with MS graduates at August 2023 Commencement.

 * During the period of 2019-2023, five faculty members of the actuarial science program at MTSU have published over eighty (80) papers in refereed journals in the fields of actuarial science, mathematical finance, statistics, data analysis, and computational sciences. Among them, 5 papers were published in the SOA-CAE designated journals with additional 12 publications of actuarial science published in other refereed professional journals. Here are the 5 papers published in the SOA designated journals for CAE applications:

1. Shuzhe Xu, Chuanlong Zhang, and **Don Hong**, BERT-based NLP techniques for classification and severity modeling in basic warranty data study, *Insurance: Mathematics and Economics*, Volume 107, November 2022, Pages 57-67. <https://doi.org/10.1016/j.insmatheco.2022.07.013>
2. Shuzhe Xu, **Vajira Manthunga**, **Don Hong**, Framework for BERT Based NLP Models with Applications to Warranty Policy Loss Prediction, *Variance*, the Casualty Actuarial Society Research Journal, November 2023. <https://variancejournal.org/article/89002>
3. **L. Xiong**, **V. A. Manathunga**, J. Luo, N. Dennison, R. Zhang, Z. Xiang, AutoReserve: a web-based tool for personal auto insurance loss reserving with classical and machine learning methods, *Risks*, (2023), 11(7), 131. <https://doi.org/10.3390/risks11070131>
4. **L. Xiong**, J. Luo, H. Vise, M. White, Distributed Least-Squares Monte Carlo for American Option Pricing, *Risks*, 11(8), 145. <https://doi.org/10.3390/risks11080145>
5. **Vajira A. Manathunga** and Linmiao Deng, Pricing Pandemic Bonds under Hull-White & Stochastic Logistic Growth Model. *Risks*, (2023), 11(9), 155. DOI: <https://doi.org/10.3390/risks11090155>

* Dr. Lu Xiong, ASA, was elected as the vice chair of Education and Research section and invited to attend the SOA leadership orientation in Chicago on November 16-17, 2023.

AY2022-2023 AMSA Officers

- President: Tanner OGrady; Vice President of Graduate Affairs: Danlei Zhu; Vice President of Undergraduate Affairs: Zachary Delfendahl; Vice President of International Student Affairs: Yunhui Xi; Treasurer and Secretary: Nicholas Drainas.

Actuarial Student Fund

The Actuarial Student Foundation was created to support actuarial students in their actuarial career development. We appreciate the individuals and companies who have contributed to this foundation. If you are interested in supporting, please make checks or money orders payable to **MTSU Actuarial Student Foundation (#92935)** and mail it to:

Program of Actuarial Science, MTSU P.O. Box 34, 1301 E. Main St., Murfreesboro, TN 37132, USA.

A tax-deductible statement for the contribution will be provided from MTSU Foundations Office. Please also check with your company about matching contributions. If you are interested in setting up a scholarship for actuarial students at MTSU bearing a person's or a company's name, please contact Dr. Don Hong, don.hong@mtsu.edu.