

## Jesse B. Crawford

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CONTACT INFORMATION      Department of Mathematics      jrcrawford@tarleton.edu  
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EDUCATION      **Ph.D. in Mathematics**, Indiana University, 2008.

- Dissertation: “Interpretation of Eigenvalues in Multivariate Statistical Analysis and Bartlett’s Test for Riesz Distributions”
- Advisor: Steen Andersson

**B.S. in Mathematics**, Angelo State University, 2002.

PROFESSIONAL EXPERIENCE      **Associate Professor**, Fall 2015 – Present.  
Department of Mathematics  
Tarleton State University, Stephenville, TX.

**Senior Research Scientist**, Summer 2019 – Present.  
Tarleton Analytics Institute  
Tarleton State University, Stephenville, TX.

**Assistant Professor**, Fall 2008 – Fall 2015.  
Department of Mathematics  
Tarleton State University, Stephenville, TX.

**Associate Instructor**, Fall 2002 – Spring 2008.  
Department of Mathematics  
Indiana University, Bloomington, IN.

RESEARCH INTERESTS      Multivariate Statistical Analysis, Graphical Models, Group Invariant Models, Applied Data Science, and Machine Learning

PUBLICATIONS      **Essential Trigonometry without Geometry, Part II: Generalizations and Applications**, with John Gresham and Bryant Waytt, December 2020. *Texas Journal of Science*, 72(1).

**Essential Trigonometry without Geometry**, with John Gresham and Bryant Waytt, November 2019. *Texas Journal of Science*, 71(1).

***N*-Body Approach to the Traveling Salesman Problem**, with J. Seay, E. Gonzalez, S. Lowe, and B. Wyatt, March 2019. *Proceedings of the International Conference on Technology in Collegiate Mathematics*.

**Developing Climate Model Ensembles: A Comparative Case Study**, with J. Booth and K. Venkataraman, January 2019. *Journal of Hydrology*, 568, 160-173.

**A Bifurcation Problem in Two Pond Amphibian Population Modeling**, with Peter White and Keith Emmert, March 2018. *Proceedings of the 29th Annual International Conference on Technology in Collegiate Mathematics*.

**Modeling the Impact of CAFOs on Nitrate Contamination in the Middle Trinity Aquifer of Central Texas**, with Kartik Venkataraman and Keith Emmert, May 2015. *Proceedings of the 2015 Environmental and Water Resources Institute Congress*.

**A Likelihood Ratio Test for Equality of Natural Parameters for Generalized Riesz Distributions**, with Steen Andersson, May 2014. *Sankhya, The Indian Journal of Statistics*, 77A(1), 186-210.

**General Canonical Correlations with Applications to Group Symmetry Models**, with Steen Andersson, August 2010. *Journal of Multivariate Analysis*, 101(7), 1547-1558.

PRESENTATIONS

**Improving Stakeholder Value by Mitigating Insurance Losses through Analytics & Machine Learning**, Tarleton Analytics Institute Online Seminar, November 2020.

**Ensemble Models of Climate Variability in the Gulf Basin Region of North America**, Mathematical Association of America Texas Section meeting, El Centro College, April 2018.

**Modeling the Impact of CAFOs on Nitrate Contamination of Water Wells**, Mathematical Association of America Texas Section meeting, Stephen F. Austin State University, April 2016.

**Testing Equality of Natural Parameters for Generalized Riesz Distributions**, Mathematical Association of America Texas Section meeting, Texas A&M International University, April 2014.

**The Impact of Innovative Student Success Strategies in Freshman Mathematics Courses**, Faculty and Staff Lunch Lounge, Tarleton State University, March 2014.

**An Analysis of Admissions Standards Based on High School Rank and SAT Scores**, Mathematical Association of America Texas Section Meeting, Texas Tech University, April 2013.

**A Brief Introduction to Game Theory**, Tarleton State University Math Club, April 2011.

**Group Actions in Statistics**, Mathematical Association of America Texas Section Meeting, University of Texas at Tyler, April 2011.

**Overview of Mathematical Statistics**, Tarleton State University Math Club, April 2009.

**Canonical Correlations for Group Symmetry Models**, Conference of Texas Statisticians, Sam Houston State University, March 2009.

STUDENT  
RESEARCH &  
PRESENTATIONS

Petela, N. (2020). “Counterintuitive No Matter How You Cut It,” Presented at the Texas Oklahoma Regional Undergraduate Symposium, Cameron University, Lawton, OK.

Seay, J. (2019). “ $N$ -Body Approach to the Traveling Salesman Problem,” Presented at the 99th Annual Meeting of the Texas Section of the Mathematical Association of America, Tarleton State University, Stephenville, Texas.

Ebert, D. (2016). “A Genetic Algorithm Approach to Finding an Optimal Strategy for a Folk Dice Game”, Presented at the 96th Annual Meeting of the Texas Section of the MAA, Nacogdoches, TX.

Stewart, J. (2016). “Analyzing EEG Entropy for Predictions of Seizures”, Presented at the 96th Annual Meeting of the Texas Section of the MAA, Nacogdoches, TX.

Brown, J., Jordan, M., and Swayze, A. (2016). “Predicting Party Affiliation Using Social Media”, Presented at the 96th Annual Meeting of the Texas Section of the MAA, Nacogdoches, TX.

Booth, J., Tomlinson, L, and Upreti, P. (2015). “Effectively Using Data Warehousing to Store Non-Profit Data”, Presented at Pathways Student Research Symposium, Texas A&M University, Corpus Christi, TX.

Culver, N., McCoy, C., and Tintera, C. (2015). “Flavors of Physics: Finding  $\tau$  to  $\mu\mu\mu$  Lepton Decay”, Presented at Pathways Student Research Symposium, Texas A&M University, Corpus Christi, TX.

Barr, L., Bresz, K., Geertz-Larson, P., Koo, J., Kristufek, P., Simkhada, V., Crawford, J., and Little, B. (2014). “Using Statistical Models to Predict Anomalous Crop Insurance Claims”, Presented at the Tarleton Student Research Symposium, Stephenville, TX.

Ator, R., Gibson, D., Mysnyk, D., Wisseman, A., Simkhada, V., Crawford, J., and Little, B. (2014). “Unsupervised Learning Classification of U.S. Crop Insurance Claims Using the NDVI: Saving U.S. Taxpayer Dollars”, Presented at the National Consortium for Data Science Data Showcase, Chapel Hill, NC.

Ator, R., Gibson, D., Mysnyk, D., Wisseman, A., Crawford, J., and Little, B. (2013). “Not Enough Sun in Oklahoma”, Presented at the Pathways Student Research Symposium, Texas A&M University-Kingsville, Kingsville, TX.

Nayani, A. (2012). *Logistic Regression Models for Effective Course Placement: Determining which Factors Influence Success Rates in Freshman Undergraduate Courses.* Master’s thesis, Tarleton State University, Stephenville, TX.

GRANTS

Lambert, B. D. (Principal), Thorne, T. (Co-Principal), Crawford, J. B. (Co-Principal), “Identifying Anomalous Health Care Claims,” Sponsored by Blue Cross Blue Shield of Texas, \$1,000,000. (February 2020 - Present).

Emmert, K. E. (Principal), Crawford, J. B. (Co-Principal), White, P. (Supporting), “Organized Research Grant,” Tarleton State University, \$24,891. (August 2008 - August 2009).

HONORS AND  
AWARDS

**Distinguished Service Award**, Tarleton State University, Spring 2013 and Fall 2018.

**William B. Wilcox Mathematics Award**, Indiana University, Spring 2006.

COURSES TAUGHT

- MATH 1316 Plane Trigonometry
- MATH 2413 Calculus I
- MATH 2414 Calculus II
- MATH 3433 Calculus III
- MATH 1342 Elementary Stat. Methods
- MATH 3320 Foundations of Math.
- MATH 3364 Data Analysis
- MATH 3450 Principles of Biostatistics
- MATH 3311 Prob. and Statistics I
- MATH 4311 Prob. and Statistics II
- MATH 5301 Nonparametric Statistics
- MATH 5305 Statistical Models
- MATH 5350 Applied Linear Algebra
- MATH 5364 Data Mining I
- MATH 5366 Data Mining II
- MATH 5088 Master's Thesis

SERVICE

**Department of Mathematics**

- *Assessment Coordinator* for the Graduate Program, September 2019 – Present. Responsible for meeting with faculty to collect assessment data and discuss action plans, while keeping findings up-to-date in the online assessment system.
- *Coordinator* for the Graduate Program, September 2015 – September 2019. Responsible for recruiting and advising students, aggregating assessment data, and maintaining the graduate program website and handbook.
- *Graduate Program Review*, written with Dr. Bowen Brawner and Dr. Eileen Faulkenberry, December 2017 – June 2018.
- *Graduate Handbook*, written October 2016.
- *Faculty Search Committee*, Member, October 2015 – February 2016.
- *Faculty Search Committee*, Chair, December 2014 – March 2015.
- *Comprehensive Oral Examination Committees*, 2009 – Present.

**Mathematics Curriculum Development**

- MATH 3364: Data Analysis, October 2019.
- MATH 5305: Statistical Models, September 2011.
- MATH 4311: Probability and Statistics II, October 2009.

**University Service**

- *Student Retention Model*, June 2020 – February 2021. Built a statistical model for the Academic Standards Committee that predicts student retention based on high school rank, high school GPA, and SAT/ACT scores. The purpose of the model is to help Academic Standards Committee members make informed decisions regarding admissions requirements.
- *Academic Standards Committee*, September 2009 – December 2020

- *Actuarial VEE Certification*, December 2018 – January 2019. Worked with faculty in the Department of Accounting, Finance, and Economics to seek VEE certification from the Society of Actuaries in Accounting/Corporate Finance and Economics.
- *Tarleton Student Research Symposium*, Faculty Mentor and Judge, November 2013, November 2014, October 2017, and October 2018.
- *Pathways Student Research Symposium*, Faculty Mentor and Judge, November 2013, October 2015, and November 2017.
- *Texan Tour Academic Fair*, November 2009, October 2016, and March 2017.
- *Faculty Senate*, January 2012 – January 2014.
- *COST Curriculum Committee*, January 2010 – January 2013.
- *Retention Data Committee*, January 2012 – May 2012.
- *Retention Functional Committee*, March 2011 – June 2011.
- *Faculty Partner Program*, Faculty Mentor, September 2012 – May 2013.
- *Angelo State University Professional Job Fair*, Student Recruiting, September 2010.

#### Public Service

- *Service Day*, Chamberlain Elementary, March 2018 and March 2019.
- *Service Day*, Stephenville Public Library, April 2017.
- *Service Day*, Office of Development, Tarleton State University, 2016.
- *UIL Contest Director*, February 2009 and February 2011.
- *Science Olympiad Contest Director*, February 2009.

#### PROFESSIONAL DEVELOPMENT

**MAA Professional Enhancement Program in Mathematical Biology**, Texas Tech University, July 2009.

**Spring Meeting of Texas Project NExT**, University of North Texas, April 2009.

**Fall Meeting of Texas Project NExT**, Sam Houston State University, September 2008.

**Actuarial Exam P**, Fall 2004. Received a perfect score on the first actuarial exam.

#### CONFERENCES ATTENDED

- Tarleton Analytics Institute Online Seminar, November 2020.
- Mathematical Association of America Texas Section Meeting, Stephenville, TX, March 2019.
- Texas Undergraduate Mathematics Conference, Nacodoches, TX, November 2018.
- Mathematical Association of America Texas Section Meeting, Dallas, TX, April 2018.

- Texas Undergraduate Mathematics Conference, San Antonio, TX, October 2017.
- Second Annual Life Science Summit, Arlington Texas, October 2016.
- Mathematical Association of America Texas Section Meeting, Nacodoches, TX, April 2016.
- Joint Mathematics Meetings of the American Mathematical Society and the Mathematical Association of America, Seattle, WA, January 2016.
- Pathways Student Research Symposium, Corpus Christi, 2015.
- Joint Mathematics Meetings of the American Mathematical Society and the Mathematical Association of America, San Antonio, TX, January 2015.
- National Consortium for Data Science Data Showcase, Chapel Hill, NC, May 2014.
- Mathematical Association of America Texas Section Meeting, Texas A&M International University, Kingsville, TX, April 2014.
- Pathways Student Research Symposium, Texas A&M International University, Kingsville, TX, November 2013.
- Mathematical Association of America Texas Section Meeting, Texas Tech University, Lubbock, TX, April 2013.
- Mathematical Association of America Texas Section Meeting, University of Texas at Tyler, Tyler, TX, April 2011.
- Mathematical Association of America Texas Section Meeting, University of North Texas, Denton, TX, April 2009.
- Conference of Texas Statisticians, Sam Houston State University, Huntsville, TX, March 2009.
- Fourth Annual Texas Undergraduate Mathematics Conference, Sam Houston State University, Huntsville, TX, September 2008.