

Xueyan (Sherry) Liu

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EDUCATION

- Ph.D., Aug. 2013 in Mathematics, Baylor University, Waco TX.
- M.S., Jul. 2004 in Applied Mathematics, Ocean University of China, Qingdao, China.
- B.S., Jul. 2001 in Computational Mathematics, Jilin University, Changchun, China.

PROFESSIONAL APPOINTMENTS

- Aug. 2018 – present, Assistant Professor
Dept. of Mathematics, University of New Orleans, New Orleans LA, 70148.
- Aug. 2016 – Jul. 2018, Postdoctoral Fellow
Dept. of Biostatistics, St. Jude Children’s Research Hospital, Memphis TN, 38105.
- Aug. 2015 – Jul. 2016, Visiting Assistant Professor; Aug. 2013 – Jul. 2015, Lecturer
Dept. of Mathematics, University of Tennessee at Chattanooga, Chattanooga TN, 37403.

RESEARCH INTERESTS

- Spatial point patterns, spatial statistics
- Clustering and co-localization analysis of microscopic protein data
- Count and generalized linear models
- Longitudinal and survival analysis of clinical and medical informatics big data
- Mathematical modeling in biology, medicine, and informatics

TEACHING EXPERIENCE

- Mentoring graduate students, UNO, New Orleans, LA.
 - (Co-advisor) Mary Beth Kelly, Community Demographics, Urbanization, COVID-19, and the Distribution of Louisiana’s Main Street Recovery Grant Program Across Counties, defended on 4/15/2022.
 - Stephan Cobby Komladzei, Co-localization Analysis of Bivariate Spatial Point Pattern, MS thesis, defended on 4/7/2021.
 - Philip Amewudah, A Decision Tree Model to Predict Marginalized Zero-inflated Poisson Mean, MS thesis, defended on 4/8/2020.

- University of New Orleans, Dept. of Mathematics (Aug. 2018 – present)
 - Statistical Learning (Spring 2019, Fall 2019,2020,2021,2022) - **Online** course
 - Advanced Statistical Learning (Spring 2020,2021,2022,2023) - **Online** course
 - Introduction to Abstract Algebra (Fall 2021,2022)
 - Elementary Differential Equations (Fall 2019,2020, Spring 2021)
 - Elementary Statistical Methods (Fall 2018,2019, Spring 2019,2022,2023)
 - Pre-calculus Algebra (Fall 2018)
- University of Tennessee at Chattanooga, Dept. of Mathematics (Aug. 2013 – Jul. 2016)
 - Differential Equations (Spring 2016)
 - Multi-variable Calculus (Spring 2015, Fall 2015)
 - Calculus II (Fall 2014, Spring 2016)
 - Calculus for Business Students (Fall 2013)
 - Combined Pre-calculus (Fall 2013, Fall 2014)
 - Pre-calculus II (Spring 2015, Fall 2015)

PUBLICATIONS

R package:

Jiahui Xu, Xueyan Liu, Lin Li, Cheng Cheng, Hui Zhang, R package Colocalization: Normalized Spatial Intensity Correlation. 2018. Under regular maintenance and development. <https://cran.r-project.org/web/packages/colocalization/index.html>

Peer-reviewed Papers:

40. Ping-Chung Chen, et al., Hongbo Chi, Interplay of brain-resident CD8+ T cells and microglia restrains murine Alzheimer's disease pathology, *Science*, under review.

39. **Xueyan Liu**, Stephan C. Komladzei, Cliff Guy, KCBC - a correlation-based method for colocalization analysis using bivariate Ripley's K function, under review.

38. **Xueyan Liu**, Clifford S. Guy, Margaret Flanagan, Emilio Boada Romero, Douglas Green, Cheng Cheng, Hui Zhang, Unbiased and Robust Analysis of Co-localization in Super-resolution Images. *Statistical Methods in Medical Research*, 2022. <https://journals.sagepub.com/doi/10.1177/09622802221094133>.

37. Clifford Guy, D. Miltrea, P. Chou, J. Temirov, K. Vignali, **Xueyan Liu**, H. Zhang, R. Kriwacki, M. Bruchez, S. Watkins, C. Workman, Dario Vignali, LAG3 associates with TCR/CD3 complexes and suppresses signaling by driving CD4/CD8:p56^{lck} dissociation, *Nature Immunology*, 2022, **23**: 757–767.

36. Swantje Liedmann, **Xueyan Liu**, Cliff S. Guy, Jeremy C. Crawford, Diego A. Rodriguez, Duygu Kuzuoglu-Ozturk, Ao Guo, Jamshid Temirov, Mark J. Chen, Davide Ruggero, Hui Zhang, Paul Thomas, Douglas Green, Localized translation of c-Myc drives divergent cell fate in CD8⁺ T cells, *Molecular Cell*, July 2022, Pages 2401–2414.e9.
35. Surendhar Reddy Chepyala[†], **Xueyan Liu**[†], Zhiping Wu, Alex M. Breuer, Ji-Hoon Cho, Yuxin Li, Ariana Mancieri, Yun Jiao, Hui Zhang, Junmin Peng, JUMPt: ordinary differential equation-based protein turnover modeling of mass spectrometric data from metabolically labeled animals, *Analytical Chemistry*, 2021, **93**(40): 13495-13504. [†]: co-first author.
34. Guotong Fu, C. Guy, N. Chapman, G. Palacios, J. Wei, P. Zhou, L. Long, Y. Wang, C. Quan, Y. Dhungana, H. Huang, A. KC, H. Shi, S. Rankin, S. Brown, A. Johnson, R. Wakefield, C. Robinson, **Xueyan Liu**, A. Sheyn, J. Yu, S. Jackowski, Hongbo Chi, Metabolic control of TFH cells and humoral immunity by phosphatidylethanolamine, *Nature*, 2021 Jul, **595**: 724-729.
33. **Xueyan Liu**, Wencong Chen, Tian Chen, Bo Zhang, Hui Zhang, Marginal Effects and Incremental Effects in Two-part Models for Endogenous Healthcare Utilization in Health Services Research, *Health Services and Outcomes Research Methodology*, **20** (2020): 111 – 139.
32. Hui Zhang, Li Tang, Yuanyuan Kong, Tian Chen, **Xueyan Liu**, Zhiwei Zhang, Bo Zhang. Distribution-free Models for Latent Mixed Population Responses in a Longitudinal Setting with Missing Data. *Statistical Methods in Medical Research*, 2018. DOI: 10.1177/0962280218801123.
31. **Xueyan Liu**, Bo Zhang, Li Tang, Zhiwei Zhang, Ning Zhang, Jeroan J. Allison, Deo Kumar Srivastava, Hui Zhang, Are marginalized two-part models superior to non-marginalized two-part models for count data with excess zeroes? Estimation of marginal effects, model misspecification, and model selection, *Health Services and Outcomes Research Methodology*, **18** (2018), 175–214.
30. **Xueyan Liu**, Bryan Winter, Li Tang, Bo Zhang, Zhiwei Zhang, Hui Zhang, Simulating comparisons of different computing algorithms fitting zero-inflated Poisson models for zero abundant counts, *Journal of Statistical Computation and Simulation*, **87** (2017), 2609–2621.
29. John R Graef, Lingju Kong, **Xueyan Liu**, Multiple anti-periodic solutions to a discrete fourth order nonlinear equation, *Differential Equations and Dynamical Systems*, (2016), DOI: 10.1007/s12591-016-0293-y.
28. John R Graef, Lingju Kong, **Xueyan Liu**, Existence of solutions to a discrete fourth order periodic boundary value problem, *J. of Difference Equations and Appl.*, **22** (2016), 1167–1183.
27. **Xueyan Liu**, The solution matching by Liapunov theory of BVPs with odd gaps in boundary conditions for n th order differential equations, *Communications in Applied Analysis*, **19** (2015), 579–588.
26. Richard I. Avery, Johnny Henderson and **Xueyan Liu**, Multiple fixed point theorems with omitted ray conditions, *Communications in Applied Analysis*, **19** (2015), 43–60.
25. Richard I. Avery, John Graef and **Xueyan Liu**, A compression fixed point theorem of operator type, *Journal of Fixed Point Theory and Application*, **17** (2015), No. 1, 83–97.

24. Richard I. Avery, Johnny Henderson and **Xueyan Liu**, Omitted ray fixed point theorem, *Journal of Fixed Point Theory and Applications*, **17** (2015), No. 2, 313–330.
23. John Graef and **Xueyan Liu**, Existence of positive solutions of a fractional boundary value problem involving with bounded linear operators, *Journal of Nonlinear Functional Analysis*, **2014** (2014), Article ID 13.
22. Douglas Anderson, Richard Avery, **Xueyan Liu**, and Johnny Henderson, Functional omitted ray fixed point theorem, *Journal of Fixed Point Theory*, **2014** (2014), Article ID 7.
21. **Xueyan Liu**, Nonlocal boundary value problems with even gaps in boundary conditions for third order differential equations, *Dynamic Systems and Applications*, **23** (2014), 465–478.
20. Johnny Henderson and **Xueyan Liu**, Positive solutions of fractional differential equations with bounded linear functional conditions, *Nonlinear Studies*, **20** (2013), No 4, 559–570.
19. Johnny Henderson, **Xueyan Liu**, Shawn Sutherland and Yu Tian, Positive solutions for a second order impulsive BVP with bounded linear operator conditions, *Dynamics of Continuous, Discrete and Impulsive Systems, Series A: Mathematical Analysis*, **20** (2013), No. 5, 571–592.
18. Yu Tian, Johnny Henderson, **Xueyan Liu**, Shawn Sutherland, Existence and uniqueness of positive solutions for even order singular impulsive boundary value problem, *Dynamics of Continuous, Discrete and Impulsive Systems, Series A: Mathematical Analysis*, **20** (2013), No. 1, 107–120.
17. Johnny Henderson, **Xueyan Liu**, Shawn Sutherland, and Yu Tian, Differences and smoothness of solutions for boundary value problems for functional difference equations, *Communications in Applied Analysis*, **16** (2012), No. 4, 619–628.
16. Douglas R. Anderson, Richard I. Avery, Johnny Henderson, and **Xueyan Liu**, Multiple fixed point theorems utilizing operators and functionals, *Communications in Applied Analysis*, **16** (2012), No. 3, 377–387.
15. **Xueyan Liu**, Jeffrey T. Neugebauer, and Shawn Sutherland, Application of a functional type compression expansion fixed point theorem for a right focal boundary value problem on a time scale, *Communications on Applied Nonlinear Analysis*, **19** (2012), No. 2, 25–39.
14. Douglas R. Anderson, Richard I. Avery, Johnny Henderson and **Xueyan Liu**, Fixed point theorem utilizing operators and functionals, *Electronic Journal of Qualitative Theory of Differential Equations*, (2012), No. 12, 16 pp.
13. Douglas R. Anderson, Richard I. Avery, Johnny Henderson and **Xueyan Liu**, Multiple fixed point theorems of operator type, *International Electronic Journal of Pure and Applied Mathematics*, **3** (2011), No. 2, 173–185.
12. Johnny Henderson and **Xueyan Liu**, BVP's with odd differences of gaps in boundary conditions for n th order ODE's by matching solutions, *Computers and Mathematics with Applications*, **62** (2011), 3722–3728.
11. Douglas R. Anderson, Richard I. Avery, Johnny Henderson, **Xueyan Liu**, and Jeffrey W.

Lyons, Existence of a positive solution for a right focal discrete boundary value problem, *Journal of Difference Equations and Applications*, **17** (2011), No. 11, 1635–1642.

10. Douglas R. Anderson, Richard I. Avery, Johnny Henderson and **Xueyan Liu**, Existence of positive solutions of a second order right focal boundary value problem, *Communications on Applied Nonlinear Analysis*, **18** (2011), 41–52.

9. Douglas R. Anderson, Richard I. Avery, Johnny Henderson and **Xueyan Liu**, Operator type expansion-compression fixed point theorem, *Electronic Journal of Differential Equations*, **2011** (2011), No. 42, 11 pp.

8. **Xueyan Liu**, Nonlocal boundary-value problems for n -th order ordinary differential equations by matching solutions, *Electronic Journal of Differential Equations*, **2011** (2011), No. 17, 9 pp.

7. **Xueyan Liu**, Boundary value problems with gaps in boundary conditions for differential equations by matching solutions, *Communications on Appl. Nonlinear Analysis*, **17** (2010), 81–88.

6. Johnny Henderson, **Xueyan Liu**, Jeffrey W. Lyons and Jeffrey T. Neugebauer, Right focal boundary value problems for difference equations, *Opuscula Mathematica*, **30** (2010), 447–456.

5. **Xueyan Liu** and Binggen Zhang, Remarks on multiple symmetric positive solutions of higher-order difference equations with Lidstone boundary conditions, *International Journal of Dynamical Systems and Differential Equations*, **1** (2007), 68–74.

4. **Xueyan Liu** and Binggen Zhang, Eigenvalues of discrete Lidstone boundary value problems (Chinese), *Acta Mathematica Sinica, Chinese Series*, **49** (2006), 617–624.

3. Binggen Zhang, Xinzhou Yan and **Xueyan Liu**, Oscillation criteria of certain delay dynamic equations on time scales, *Journal of Difference Equations and Applications*, **11** (2005), 933–946.

2. **Xueyan Liu** and Binggen Zhang, Nonoscillations for odd-dimensional systems of linear retarded functional differential equations, *Journal of Mathematical Analysis and Applications*, **290** (2004), 481–496.

1. Binggen Zhang and **Xueyan Liu**, Existence of multiple symmetric positive solutions of higher order Lidstone problems, *Journal of Mathematical Analysis and Applications*, **284** (2003), no. 2, 672–689.

Textbooks:

2. John R Graef, Johnny Henderson, Lingju Kong, **Xueyan Liu**, *Ordinary Differential Equations and Boundary Value Problems. Vol II: Boundary Value Problems*, in Trends in Abstract and Applied Analysis (Vol. 7), World Scientific Publishing Co. Pte. Ltd., 2018.

1. John R Graef, Johnny Henderson, Lingju Kong, **Xueyan Liu**, *Ordinary Differential Equations and Boundary Value Problems. Vol I: Advanced Ordinary Differential Equations*, in Trends in Abstract and Applied Analysis (Vol. 7), World Scientific Publishing Co. Pte. Ltd., 2018.

PRESENTATIONS

Invited Presentations:

- *Spatial point patterns and co-localization of two patterns* (May 2, 2022)
Math Colloquium, UNO.
- *A novel statistical tool for analyzing colocalization in super-resolution images* (Oct. 21, 2019)
School of Public Health, Louisiana Southern University, New Orleans, LA.
- *Clustering* – in the series of Pi Talks (Nov. 16, 2018)
Presented by University of New Orleans Chapter of the American Mathematical Society.
- *Colocalization analysis of multi-colored single-molecule microscopy images* (March 12-13, 2019).
A special session on “Differential Equations in Mathematical Biology” at the AMS Sectional Meeting at Auburn AL. Auburn AL: Auburn University.
- *Analysis of Co-localization in Spatial Data* (Dec. 14th, 2017)
Biostatistics Research Seminar, St. Jude Children’s Research Hospital, Memphis TN.
- *ODE Modelling for Signal Transduction Pathways* (Mar. 23rd, 2017)
Mathematical Modeling by Ordinary Differential Equations (Jan. 9th, 2017)
An Introduction of Differential Equations (Oct. 27th, 2016)
Club of Integrative Systems Biology, Department of Structural Biology and Developmental Neurobiology, St. Jude Children’s Research Hospital, Memphis TN.
- *Zero-Inflated Poisson Models* (Oct. 27th, 2016)
Continuing Education Series, the 2nd Season, Department of Biostatistics, St. Jude Children’s Research Hospital, Memphis TN.
- *Existence of Positive Solutions of Fractional Boundary Value Problems Involving Bounded Linear Operators* (Jan. 12th, 2015)
2015 AMS-MAA Joint Mathematics Meeting, AMS Special Session on Fractional, Stochastic, and Hybrid Dynamic Systems with Applications, San Antonio TX.
- *Nonlocal Boundary Value Problems with Even Gaps in Boundary Conditions for Third Order Differential Equations* (Oct. 5th, 2013)
Fall Southeastern Sectional Meeting of the AMS, AMS Special Session on Fixed Point Theorems and Applications to Integral, Difference, and Differential Equations, University of Louisville, Louisville KY.
- *Boundary Value Problems for Differential Equations by Solution Matching* (Mar. 15th, 2013)
New Trends in Differential and Difference Equations, Dept. of Mathematics, University of Tennessee at Chattanooga, Chattanooga TN.

- *Positive solutions of Fractional Differential Equations with Bounded Linear Functional Conditions* (Jan. 12th, 2013)
2013 AMS-MAA Joint Mathematics Meeting, AMS Special Session on Fractional, Hybrid, and Stochastic Dynamic Systems with Applications, San Diego CA.
- *Positive Solutions for a Second Order Impulsive BVP with Bounded Linear Operator Conditions* (Oct. 13th, 2012)
Southeastern Fall Section Meeting of the AMS, AMS Special Session on Application of Functional Analytic Techniques to Nonlinear Boundary Value Problems, Tulane University, New Orleans LA.

Contributed Presentations:

- *KCBC a correlation based method for co localization analysis using Ripley's K functions* (May 23, 2022)
Poster session of 2021 Statistical Methods in Imaging Conference (SMI 2021), Vanderbilt University, TN.
- *A New Correlation-based Method for Co-localization Analysis in Super-resolution Images* (Aug 8, 2021)
Imaging Speed Session (220687) of 2021 Joint Statistical Meetings (JSM 2021). Virtual conference.
- *A Novel Correlation-based Co-localization Analysis of Super-resolution Images* (May 17, 2021)
Poster session of 2021 Statistical Methods in Imaging Conference (SMI 2021), Emory University, GA.
- *Marginal effects in two-part models for endogenous healthcare utilization in health services research* (Nov 16–20, 2020)
Oral presentation, InnovateUNO 2020, University of New Orleans, New Orleans LA.
- *A clustering method in spatial statistics* (Nov. 19, 2019)
InnovateUNO 2019, University of New Orleans, New Orleans LA.
- *Colocalization analysis of multi-colored super-resolution images* (Sept. 28, 2018)
Poster session of Workshop on Point Process Models. TAMU, College Station, TX.
- *Hypothesis Tests and Power* (Mar. 21st, 2018)
Hematology Oncology/Infectious Diseases/Biostatistics Journal Club, St. Jude Children's Research Hospital, Memphis TN.
- *Colocalization Analysis of Multi-colored Single-molecule Microscopy Images* (Feb. 2nd, 2018)
St. Jude 2018 Comprehensive Cancer Center Postdoctoral Symposium - Poster Session, St. Jude Children's Research Hospital, Memphis TN.
- *Comparisons of Different Algorithms and Statistical Packages for Fitting Zero-Inflated Poisson Models for RNA-Seq Counts* (Nov. 17th, 2016)

St. Jude 2016 Faculty-Postdoctoral Poster Session, St. Jude Children's Research Hospital, Memphis TN.

- *Existence of Positive Solutions of Riemann-Liouville Fractional Boundary Value Problems Involving Bounded Linear Operators* (Oct. 11th, 2015)
The 35th Annual Southeastern-Atlantic Regional Conference on Differential Equations, University of North Carolina at Greensboro, Greensboro NC.
- *Existence of Positive Solutions of Caputo Fractional Boundary Value Problems Involving Bounded Linear Operators* (Oct. 11th, 2014)
The 34th Annual Southeastern-Atlantic Regional Conference on Differential Equations, University of Memphis, Memphis TN.
- *Nonlocal Boundary Value Problems with Even Gaps in Boundary Conditions for Third Order Differential Equations* (Sept. 21st, 2013)
The 33rd Annual Southeastern-Atlantic Regional Conference on Differential Equations, University of Tennessee, Knoxville TN.
- *Existence of positive solutions of a second-order boundary value problem for impulsive differential equations* (Oct. 20th, 2012)
The 32nd Southeastern Atlantic Regional Conference on Differential Equations, Wake Forest University, Winston-Salem NC.
- *Existence of Positive Solutions of a 2nd Order Right Focal BVP* (Jan. 5th, 2012)
The 2012 AMS-MAA Joint Mathematics Meetings, Boston MA.
- *Boundary Value Problems for n th Order DEs by Matching Solutions* (Apr. 14th, 2011)
Texas Section of the MAA Spring Meeting, Tyler TX.
- *Nonlocal BVPs for n th Order ODE by Solution Matching* (Jan. 8th, 2011)
The 2011 AMS-MAA Joint Mathematics Meetings, New Orleans LA.

PROFESSIONAL SERVICE

- Refereed 40 plus manuscripts for more than 30 mathematical and statistical journals:
 - *Abstract and Applied Analysis*
 - *Advances in Difference Equations*
 - *Advances in Numerical Analysis*
 - *Applied Mathematics and Computation*
 - *Applied Mathematics - A Journal of Chinese Universities*
 - *Boundary Value Problems*
 - *Bulletin of the Malaysian Mathematical Sciences Society*
 - *Collectanea Mathematica*
 - *Communications in Applied Analysis*

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- *Differential Equations & Applications*
 - *Discrete Dynamics in Nature and Society*
 - *Discrete Mathematics*
 - *Dynamics of Continuous, Discrete and Impulsive Systems, A: Mathematical Analysis*
 - *Dynamic Systems and Applications*
 - *Electronic Journal of Differential Equations*
 - *Electronic Journal of Qualitative Theory of Differential Equations*
 - *International Journal of Mathematics and Mathematical Sciences*
 - *IEEE Access*
 - *IEEE/ACM Transactions on Computational Biology and Bioinformatics*
 - *Involve - A Journal of Mathematics*
 - *Journal of Function Spaces*
 - *Journal of Statistical Computation and Simulation*
 - *Journal of Operators*
 - *Journal of the Indian Mathematical Society*
 - *Mathematical Communications*
 - *Mathematical Biosciences*
 - *Mathematical Methods in the Applied Sciences*
 - *Mathematics and Statistics*
 - *Nonlinear Studies*
 - *Open Journal of Discrete Mathematics*
 - *Health Services and Outcomes Research Methodology*
 - *Portugaliae Mathematica*
 - *Qualitative Theory of Dynamical Systems*
 - *Quarterly of Applied Mathematics*
 - *Sarajevo Journal of Mathematics*
- Reviewed more than 50 publications as a reviewer for
 - Mathematical Reviews (# 094362)
 - Zentralblatt MATH (# 14642)
 - Professional Societies
 - American Statistical Association