Kevin C. Lutz
Curriculum Vitae

Contact

Position: Assistant Professor, O'Donnell School of Public Health, University of Texas Southwestern Medical Center
Address: 5323 Harry Hines Blvd., Dallas, TX 75390
Email: Kevin.Lutz@UTSouthwestern.edu
Professional: University of Texas Southwestern Medical Center
LinkedIn: Online Profile
Google Sites: Lecture Notes for Teaching
Google Scholar: Publications

Education

- *Doctor of Philosophy* and *Master of Science*, Statistics   2018-2023
  University of Texas at Dallas, Richardson, Texas
  Advisor: Dr. Qiwei Li
  Cumulative GPA: 3.812
  Dissertation Title: Bayesian statistical methods for urinary microbiome data analysis

- *Master of Arts*, Mathematics   2002-2004
  Villanova University, Villanova, Pennsylvania
  Advisors - Dr. David Sprows and Dr. Alice Deanin
  Thesis - *Game Theory: Methods, Theory, and Applications*

- *Graduate Certificate*, Theology   2004-2006
  Washington Theological Union, Washington, DC

- *Bachelor of Science*, Mathematics   1997-2001
  DeSales University, Center Valley, Pennsylvania

Employment History

1. *Assistant Professor*   2023-present
   The University of Texas Southwestern Medical Center, Dallas, TX
   O'Donnell Jr. School of Public Health

2. *Teaching Associate*   2022-2023
   The University of Texas at Dallas, Richardson, TX

3. *Adjunct Instructor*   2019-2020
   Collin County Community College, Plano, TX

4. *Teaching Assistant*   2018-2022
   The University of Texas at Dallas, Richardson, TX

5. *Assistant Organist and Bass Section Leader*   2018-present
   Saint Francis of Assisi Catholic Church, Frisco, TX

6. *Mathematics Teacher*   2001-2018
   Archdiocese of Philadelphia Secondary School System

7. *Music Director*   2011-2018
   Saint Robert Bellarmine Catholic Church, Warrington, PA

8. *Mathematical Literacy Coach and Instructor* 2012-2015
   University of Pennsylvania, Penn Literacy Network, Philadelphia, PA

9. *Music Director* 2006-2011
   Saint Anne Catholic Church, Philadelphia, PA

10. *Adjunct Instructor* 2005-2006
    DeSales University, Center Valley, PA

HONORS, AWARDS, CERTIFICATES, MEMBERSHIPS

UNIVERSITY OF TEXAS SOUTHWESTERN MEDICAL CENTER, DALLAS, TX

- University of Texas System AI Symposium in Health Care Planning Committee member Spring 2024
- The Association of College and University Educators (ACUE) Spring 2024
  Course Participant: Inspiring Inquiry and Preparing Lifelong Learners
  Certificate of Completion
- Strategic Planning Committee member for the O'Donnell School of Public Health Fall 2023-current
- Curriculum Committee member for the O'Donnell School of Public Health December 2023

UNIVERSITY OF TEXAS AT DALLAS, RICHARDSON, TX

- David Daniel Thesis Award, $1000 honorarium Spring 2024
- $250 Travel Award for ABGOD2023 Spring 2022
- Outstanding TA Award in Mathematical Sciences 2021
- Advanced Graduate Teaching Certificate Fall 2019
- Graduate Teaching Certificate Spring 2019
- Full Scholarship and Graduate Assistantship 2018-current

AMERICAN STATISTICAL ASSOCIATION

- University Representative (by invitation) for the North Texas Chapter Summer 2023
- Member Since 2020

CERTIFICATES FROM COURSERA

- Bayesian Statistics: Techniques and Models July 2020
- Bayesian Statistics: From Concept to Data Analysis May 2020

CERTIFICATES FROM UDEMY

- Applied Time Series Analysis and Forecasting with R Projects August 2021
- Introduction to Time Series Analysis and Forecasting in R July 2021
- Survival Analysis in R December 2020
- Building Interactive Apps with Shiny in R August 2020

CERTIFICATES FROM UNIVERSITY OF MISSOURI

- Intro to Cloud Computing with R September 2020

ARCHBISHOP RYAN HIGH SCHOOL, PHILADELPHIA, PA

- $2000 Travel Award for T^3 International Conference, Chicago, IL March 2017

EDUCATION EXPERIENCE

Co-Director of the Instructional Excellence Unit (IEU)

1. The University of Texas Southwestern Medical Center, Dallas, TX — May 2024-present

   - Designed to help prioritize the educational mission in the O'Donnell School of Public Health
   - Empower faculty members to craft and sustain high-quality teaching and high-impact courses.
   - Current goals of the IEU:
     (a) Instructional design and curriculum development support
     (b) Technology integration and training resources
     (c) Assessment and continuous improvement

Academic Advisor

1. The University of Texas Southwestern Medical Center, Dallas, TX

   - Master of Public Health degree program in the O'Donnell School of Public Health
   - Duties
     (a) Regularly monitor student welfare
     (b) Academic performance monitor
     (c) Course registration
     (d) Assist in determining elective courses
     (e) Guidance and coordination for the Applied Practice Experience and choose topics on the Integrated Learning Experience project and final sign-off
   - Current advisees
     (a) Nikita Madhavaram (Concentration: Quantitative Data Science) — December 2023-current

Biostatistical Mentor - Dean's Scholars Program and Clinical Researcher Academy

- Duties
  1. Attend WIPs and provide feedback to presenters.
  2. Match scholars with a biostatistician for support on their grants.

Instructor

1. The University of Texas Southwestern Medical Center, Dallas, TX

   - QDS 5301: Introduction to Analysis of Public Health Data (Biostatistics) — Fall 2023
     Class size: 33 students in Master of Public Health degree program

   - Invited lecture: Master of Science in Clinical Science program — September 2023
     Title: Hypotheses, Sample Size, and Power

2. The University of Texas at Dallas, Richardson, TX

   - STAT 3341.002: Probability and Statistics in Computer Science and Software Engineering — Spring 2023
     Overall evaluation score: 4.95/5.00 ; Class size 115
   - STAT 3341.003: Probability and Statistics in Computer Science and Software Engineering — Spring 2023
     Overall evaluation score: 4.93/5.00 ; Class size 115
   - STAT 3341.001: Probability and Statistics in Computer Science and Software Engineering — Fall 2022
     Overall evaluation score: 4.85/5.00 ; Class size - 110 Computer Science students
     Overall evaluation score: 4.83/5.00 ; Class size - 10 Software Engineering students

- STAT 3341.006: Probability and Statistics in Computer Science and Software Engineering   Fall 2022
  Overall evaluation score: 4.75/5.00 ; Class size - 84 Computer Science students
  Overall evaluation score: 4.50/5.00 ; Class size - 13 Software Engineering students
  Overall evaluation score: 5.00/5.00 ; Class size - 1 Statistics student

- STAT 3341.005: Probability and Statistics in Computer Science and Software Engineering   Fall 2022
  Volunteer instructor for the first two weeks until a permanent instructor was hired.

- STAT 3341.003: Probability and Statistics in Computer Science and Software Engineering   Spring 2022
  Overall evaluation score: 4.84/5.00 ; Class size - 77 Computer Science students
  Overall evaluation score: 5.00/5.00; Class size - 22 Software Engineering students
  20% of the class are international students

3. Collin County Community College, Plano, TX

   - MATH 2412: PreCalculus   Summer 2018
     Overall evaluation score: 3.95/4.00; Class size - 25
   - MATH 2412: PreCalculus   Summer 2019
     Overall evaluation score: 3.93/4.00; Class size - 28
   - MATH 1342: Elementary Statistics   Summer 2020
     Overall evaluation score: 4.00/4.00; Class size - 17

4. Archdiocese of Philadelphia Secondary School System, Philadelphia, PA

   - Archbishop Ryan High School   2011-2018

     (i) Subjects Taught: Statistics, Geometry, PreCalculus/Trigonometry, Algebra I, Algebra II
     (ii) Course Evaluation: Proficient; Average class size - 32
     (iii) About 10% of students were international students from China and South Korea

   - Father Judge High School   2010-2011

     (i) Subject Taught: Algebra II
     (ii) Course Evaluation: Proficient; Average class size - 34

   - Northeast Catholic High School   2006-2010

     (i) Subjects Taught: Statistics, Honors Statistics, AP Calculus AB, Algebra 1, Geometry
     (ii) Course Evaluation: Proficient; Average class size - 30

   - Father Judge High School   2001-2003

     (i) Subjects Taught: Trigonometry, PreCalculus, Algebra 1
     (ii) Course Evaluation: Proficient; Average class size - 32

5. University of Pennsylvania, Penn Literacy Network (PLN), Philadelphia, PA   2012-2015

   - EDCE 550: PLN Math Literacy 1 (PreK-12) Implementing a Balanced Program
   - PLN is based in the UPenn Graduated School of Education (GSE).
   - Class size - 12 secondary teachers of mathematics.

6. DeSales University, Center Valley, PA

   - MA 121: Calculus I   Spring 2005
   - MA 122: Calculus II   Summer 2005
   - MA 510: Teaching Calculus   Summer 2006

Co-Instructor

7. University of Texas at Dallas, Richardson, TX

- STAT 3355: Introduction to Data Analysis with Dr. Qiwei Li — Fall 2021
  Overall course evaluation: 4.58/5.00; Class size: 64
- STAT 3355: Introduction to Data Analysis with Dr. Qiwei Li — Spring 2021
  Overall course evaluation: 4.68/5.00; Class size: 60
- STAT 3355: Introduction to Data Analysis with Dr. Qiwei Li — Fall 2020
  Overall course evaluation: 4.58/5.00; Class size: 73

Teaching Assistant

8. University of Texas at Dallas, Richardson, TX

* served as lead TA (the liaison between course coordinator and teaching assistants; determined the grading criteria for all homework assignments)

- STAT 3355: Data Analysis for Statisticians and Actuaries with Dr. Qiwei Li — Fall 2021
- MATH 2415*: Calculus of Several Variables with Dr. John Zweck — Fall 2021
- STAT 3355: Data Analysis for Statisticians and Actuaries with Dr. Qiwei Li — Spring 2021
- MATH 2417: Calculus I with Dr. Rabin Dahal — Spring 2021
- STAT 3355: Data Analysis for Statisticians and Actuaries with Dr. Qiwei Li — Fall 2020
- MATH 2415*: Calculus of Several Variables with Dr. John Zweck — Fall 2020
- MATH 2417: Calculus I with Dr. Mohammad Ahsan — Spring 2020
- STAT 3355: Data Analysis for Statisticians and Actuaries with Dr. Qiwei Li — Fall 2019
- MATH 2415*: Calculus of Several Variables with Dr. John Zweck — Fall 2019
- STAT 3341: Probability and Statistics in Computer Science and Software Engineering with Dr. Tristan Whalen — Spring 2019
- MATH 2419: Calculus II with Dr. Anatoly Eydelzon — Spring 2019
- STAT 3360: Probability and Statistics for Management and Economics with Dr. Yuly Koshevnik — Fall 2018
- MATH 2417: Calculus I with Dr. Mohammad Ahsan — Fall 2018

Music Director

9. Saint Robert Bellarmine Catholic Church, Warrington, PA — 2011-2018

- Planned music for Sunday masses, funerals, weddings, and holy days.
- Played piano and organ at all masses.
- Rehearsed, taught, and trained cantors, choir, and musicians on a weekly basis.
- Attended monthly meetings with the pastor and staff to plan liturgies.

10. Saint Anne Catholic Church, Philadelphia, PA — 2006-2011

- Same duties as at Saint Robert Bellarmine Catholic Church (above).

Volunteer

11. University of Texas at Dallas, Richardson, TX

- ABGOD Conference — March 2023
  - (i) Advances in Statistical and Computational Methods for Analysis of Biomedical, Genetic, and Omics Data
  - (ii) Served as a volunteer

(iii) Presented a poster on topics selected from my dissertation.

- Florence Nightingale Day hosted by Ohio State University   Fall 2022

    (i) Presented the "Law of Large Numbers" to 5 groups of high school students online.
    (ii) International students also participated.

- Florence Nightingale Day hosted by Ohio State University   Fall 2021

    (i) Presented the "Law of Large Numbers" to 5 groups of high school students online.
    (ii) International students also participated.

- Graduate School of Education: Center for Teaching and Learning (CTL)   2019-2020

    (i) Participated in seminars focused on pedagogy for teaching and learning.
    (ii) Evaluated as a teaching assistant by course coordinators.
    (iii Completed research and writing assignments.
    (iv) Earned two certificates of completion.

12. University of Pennsylvania, Penn Literacy Network (PLN), Graduate School of Education (GSE)

    - Trained and hired as a mathematical literacy coach.   2012-2015
    - Participation led to part-time paid position, which included teaching a graduate level course on mathematical literacy to math teachers of the Archdiocese of Philadelphia Secondary School System.

Current and Ongoing Research Experience   June 1, 2023-current

Lab: Dr. Philippe Zimmern, MD, University of Texas Southwestern Medical Center, Dallas, TX

- Department of Urology
- Role: Primary biostatistician
- Duties: assist and provide biostatistical support with grant/manuscript writing, statistical consultation, experimental design, sample size estimation, power estimation, data management, and data analysis to faculty, fellows, and post-docs.

Lab: Dr. Benjamin Levine, MD, FACC, FACSM, FAPS, FAHA, University of Texas Southwestern Medical Center, Dallas, TX

- Department of Internal Medicine (Cardiology Division)
- Role: Primary biostatistician
- Duties: assist and provide biostatistical support with grant/manuscript writing, statistical consultation, experimental design, sample size estimation, power estimation, data management, and data analysis to faculty, fellows, and post-docs.

Lab: Dr. Heidi Jacobe, MD, University of Texas Southwestern Medical Center, Dallas, TX

- Role: Biostatistical Education Scholar/Mentor
- Duties

    1. Evaluate quality and rigor of current biostatistical curriculum for the Master of Science in Clinical Investigation (MSCI) program.
    2. Provide statistical mentoring to MSCI students and Deans Scholars.
    3. Develop a peer mentoring program for biostatistical support within OSPH.

Research Assistant Experience

Dr. Qiwei Li Lab, University of Texas at Dallas, Richardson, TX

- A collaboration between UTD and UT Southwestern Medical Center   2020–present
- Statistical analysis of metagenomic, functional, clinical, and survival data of recurrent urinary tract infections in postmenopausal women using both frequentist and Bayesian methodologies.
- Used exploratory analysis and classical methods such as ANOVA, t-test, Kruskal-Wallis, Wilcoxon, Fisher exact test, Chi-square, Spearman/Pearson correlation, logistic regression, leave-one-out cross validation, AUC, specificity, sensitivity, and survival analysis to analyze data.
- Differential enrichment analysis: Designed a Bayesian proportion test for determining differential enrichment and trends of taxonomic functional variables by group.
- Integrative analysis: Designed a Bayesian correlation test using a Dirichlet-multinomial model to measure pairwise associations between urinary metabolites and metagenomic data.
- Network analysis: Designed a Bayesian stochastic blocking model with a Markov random field prior that performs community detection using both a binary microbiome network and taxonomic tree hierarchy information.
- Designed a Bayesian regularized logistic regression model with spike-and-slab priors for variable selection in a microbiome data setting in predicting recurrent urinary tract infections.
- Conducted large-scale simulations to test the performance of the above Bayesian models.
- At least three published papers have resulted from this collaboration.

Research Interests

- Biostatistics; Bayesian methodology, modeling, and inference; Bayesian regression and regularization; metagenomic abundance data modeling; Markov Chain Monte Carlo methods; differential abundance analysis; integrative analysis; network analysis; stochastic blocking; stochastic processes; machine learning
- Mathematics/Statistics teaching and educational pedagogy

Talks

- "Bayesian stochastic block model with Markov random field prior for microbial community detection" Professor Michael Zhang Bioinformatics Joint Seminar (UTD), Spring 2023, online
- "Bayesian statistical methods for rUTI microbiome data analysis", University of Texas Southwestern Medical Center, Spring 2023, online
- "Bayesian logistic regression modeling for determining urinary cytokine cutoff measurements for predicting recurrent urinary tract infections (rUTI)," Professor Michael Zhang Bioinformatics Joint Seminar (UTD), Fall 2021, online
- "Bayesian proportion and correlation tests for microbiome data," Professor Michael Zhang Bioinformatics Joint Seminar (UTD), Spring 2021, online
- "Urinary prostaglandin E2 (PGE2) is a biomarker for recurrent urinary tract infections (rUTI) in postmenopausal women," Professor Michael Zhang Bioinformatics Joint Seminar (UTD), Fall 2020, online
- "A review of Dirichlet-multinomial modeling microbiome data," Professor Michael Zhang Bioinformatics Joint Seminar (UTD), Spring 2020 online
- "Engaging activities in probability and statistics with a focus on literacy," T^3 International Conference, Chicago, IL, Spring 2017

Publications

* as first author

Journal Papers

1. Tahmineh Ebrahimzadeh, **Kevin C. Lutz**, Ujjaini Basu, Jessica V. Komarovsky, Jashkaran Gadhvi, Qiwei Li, Philippe E. Zimmern, Nicole J. De Nisco, "Identification of inflammatory biomarkers for improved diagnosis of recurrent UTI in postmenopausal women," ***Life Science Alliance*** (2024).

2. M. L. Neugent, A. Kumar, N. V. Hulyalkar, C. Zhang, V. H. Nguyen, J. Fuentes, **K. C. Lutz**, A. Nguyen, B. M. Sharon, E. Fan, A. Kuprasertkul, A. P. Arute, Q. Li, C. Xing, V. Shulaev, P. E. Zimmern, K. L. Palmer, N. J. De Nisco, "Recurrent urinary tract infection and estrogen hormone therapy shape urobiome ecology and function in postmenopausal women," ***Cell Reports Medicine*** (2022), 100753.

3. **K. C. Lutz***, S. Jiang, N. DeNisco, M. Neugent, X. Zhan, and Q. Li, "A survey of statistical methods for microbiome data analysis," ***Frontiers in Applied Mathematics and Statistics*** (2022).

4. Ebrahimzadeh, T., Kuprasertkul, A., Neugent, M. L., **Lutz, K. C.**, Fuentes, J. L., Gadhvi, J., ... and De Nisco, N. J. "Urinary prostaglandin E2 as a biomarker for recurrent UTI in postmenopausal women." ***Life Science Alliance*** (2021), Volume 4, Number 7, e202000948.

Submitted Publications

1. Jashkaran Gadhvi, Michael L. Neugent, **Kevin C. Lutz**, Nicole J. De Nisco, and Qiwei Li. "Higher Quantity of Bacteria in Urothelial Tissue Correlates with Increased Risk of rUTI relapse in Post-Menopausal Women Following Electrofulguration," ***eBioMedicine***, submitted January, 2024.

2. Xi Jiang, Danni Luo, Esteban Fernández, **Lutz, Kevin C**, Jie Yang, Huimin Li, Kevin W Jin, Yuanchun Zhan, Bo Yao, Suhana Bedi, Guanghua Xiao, Xiaowei Zhan, Qiwei Li, Yang Xie; "Spatial Transcriptomics Arena (STAr): an Integrated Platform for Spatial Transcriptomics Methodology Research," ***GigaScience***, submitted September, 2023.

3. **Kevin C. Lutz***, Tejasv Bedi, Michael L. Neugent, Shengjie Yang, Nicole J. De Nisco, and Qiwei Li. "A Bayesian stochastic block model with a Markov random field prior for community detection" (2023). ***Statistics in Medicine***, Submitted August 2023, under revision.

4. Tejasv Bedi, Michael L. Neugent, **Kevin C. Lutz**, Shengjie Yang, Bo Yao, Xiaowei Zhan, Nicole J. De Nisco, and Qiwei Li. "Bayesian modeling of co-occurrence microbial interaction networks" (2024). ***Biostatistics***, submitted April 2024, under review.

5. Bryce Balmain, Benjamin Levine, **Kevin C. Lutz**, et al. "Pulmonary gas exchange in relation to exercise pulmonary hypertension in patients with heart failure with preserved ejection fraction" (2024). ***European Respiratory Journal***, submitted April 2024, under review.

Publications In Progress

1. Chiou, Sy Han; Aseltine, Robert; Schilling, Elizabeth; **Lutz, Kevin**; Yan, Jun, "A bivariate two-part model for censored durations of depression and relational stressor in young adults" (2023).

2. MF Bartlett, J Ren, S Sarma, JP MacNamara, T Brazile, MF Jaffery, K Dang, D Wakem, C Hearon, **K Lutz**, PJ Fadel, MJ Haykowsky, BD Levine, VG Zaha, MD Nelson. "Skeletal Muscle Oxidative Capacity and Muscle Fat Content in Heart Failure with Preserved Ejection: Influence of Mitotoxic Medications and VO2 Efficiency Fraction".

3. SK Zamani, S Sarma, JP MacNamara, MJ Haykowsky, RB Thompson, **K Lutz**, D Wakeham, T Brazile, BD Levine, VG Zaha, MD Nelson. "Exercise cardiac magnetic resonance imaging in heart failure with preserved ejection fraction".

References

- Dr. Yang Xie, O'Donnell School of Public Health, University of Texas Southwestern Medical Center
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- Dr. Qiwei Li, Natural Sciences and Mathematics, University of Texas at Dallas
  Email: Qiwei.Li@UTDallas.edu

- Dr. Swati Biswas, Natural Sciences and Mathematics, University of Texas at Dallas
  Email: Swati.Biswas@UTDallas.edu

- Dr. Nicole J De Nisco, Biological Sciences, University of Texas at Dallas
  Email: `Nicole.DeNisco@UTDallas.edu`

- Dr. Vladimir Dragovic, Natural Sciences and Mathematics, Chair, University of Texas at Dallas
  Email: `Vladimir.Dragovic@UTDallas.edu`

- Dr. Pankaj Choudhary, Natural Sciences and Mathematics, University of Texas at Dallas
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- Dr. John Zweck, Natural Sciences and Mathematics, University of Texas at Dallas
  Email: `John.Zweck@UTDallas.edu`