

Tung-Lung Wu

Curriculum Vitae

PERSONAL INFORMATION

Address: Mississippi State University
Mathematics & Statistics
P. O. Box MA
Mississippi State, MS 39762
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E-mail: tw1475@msstate.edu

EDUCATION

Ph.D. University of Manitoba (Canada)
Statistics, Jan., 2007 – Oct. 2012

Dissertation Title: Linear and Non-linear Boundary Crossing Probabilities for Brownian Motion and Related Processes

Advisor: Dr. James C. Fu

Brief Synopsis of Research: Brownian motion is one of the most important processes in the literature. We developed a simple method to compute the non-linear boundary crossing probabilities for Brownian motion and other diffusion processes based on the finite Markov chain imbedding technique.

MS National University of Kaohsiung (Taiwan)
Statistics, Sept., 2003 – June, 2005

Thesis Title: Average Run Lengths of Control Charts for Autocorrelated Processes

BS National Dong Hwa University (Taiwan)
Applied Mathematics, Sept., 1999 – June, 2003

PROFESSIONAL EXPERIENCE

8/2020 – present	Associate Professor, Mississippi State University, MS, USA
8/2014 – 8/2020	Assistant Professor, Mississippi State University, MS, USA
8/2013 – 8/2014	Postdoc, Rutgers University, NJ, USA
8/2012 – 8/2013	Visiting Assistant Professor, University of Connecticut, CT, US
6/2010 – 4/2012	Sessional Instructor, University of Manitoba, Manitoba, Canada
1/2012 – 4/2012	Sessional Instructor, University of Winnipeg, Manitoba, Canada

RESEARCH INTEREST AND EXPERIENCE

My research interests include the following topics: boundary crossing probability (first passage time) of stochastic process, (group) sequential analysis and alpha-spending-function approach in clinical trials, distributions related to runs and patterns (scan statistics), finite Markov chain imbedding technique, spatial scan statistics and high-dimensional data analysis.

PUBLICATIONS

Submitted:

1. Tung-Lung Wu and Asanka R. Duwage (2026). Scan Statistics for Nonhomogeneous Poisson Processes with Extreme-Value Calibration and Application to CNV Detection. Submitted to *Statistics and Computing*
2. Tung-Lung Wu (2026). Distribution-free Pooled-Rank Control Charts Based on Runs and Related Statistics. Submitted to *Journal of Quality Technology*
3. Tung-Lung Wu (2026). Finite-State Bernoulli Calibration of Scan Statistics for Nonhomogeneous Poisson Processes. Submitted to *Computational Statistics and Data Analysis*

1. Tung-Lung Wu (2026). Distribution-Free Control Charts Based on Runs and Patterns. *Statistical Papers* 67. DOI: [10.1007/s00362-025-01789-5](https://doi.org/10.1007/s00362-025-01789-5)
2. Chang Yung-Ming, Fu James C., Tung-Lung Wu* (2025). Distributions of the Number of Records and the Waiting Time Distributions for the r th Record. *Methodology and Computing in Applied Probability* 27. DOI: [10.1007/s11009-025-10190-6](https://doi.org/10.1007/s11009-025-10190-6)
3. Huang-Chia Hung, Tung-Lung Wu* (2025). Who Is Playing? A Trend Analysis of Racial and Ethnic Diversity among NCAA Student-Athletes. *International Journal of Business in Sports, Tourism, and Hospitality Management*, 6(2), 65-82.
4. Tung-Lung Wu (2025). Improved Test for High-Dimensional Mean Vectors and Covariance Matrices Using Random Projection. *Mathematics*, 13(13), 2060. DOI: [10.3390/math13132060](https://doi.org/10.3390/math13132060)
5. Ying-Chen Huang, Hsin-Yi Lu, Li Zhang, Alicia Olivier, Tung-Lung Wu, Chuan-Yu Hsu, Caleb LeGrand, Huawei Zeng, Samantha Curran, Qingzhou Wang, Ramakrishna Nannapaneni, Xue Zhang, Max Ticó, Marco Mariotti, Ryan T Y Wu, Gerald F Combs Jr, Wen-Hsing Cheng (2025). Dietary Selenium Deficiency Accelerates the Onset of Aging-Related Gut Microbial Changes in Aged Telomere-Humanized Mice, With Akkermansia muciniphila Being the Most Prominent and Alleviating Selenium Deficiency-Induced Type 2 Diabetes. *Aging Cell*, e70130. DOI: [10.1111/ace1.70130](https://doi.org/10.1111/ace1.70130)
6. Jonathan Woody, Zhicong Zhao, Robert Lund, Tung-Lung Wu (2024). A forensic statistical analysis of fraud in the federal food stamp program. *The Annals of Applied Statistics*, 18(3), 2486-2510. DOI: [10.1214/24-AOAS1891](https://doi.org/10.1214/24-AOAS1891)
7. Yung-Ming Chang, Yu-Fei Hsieh, Tung-Lung Wu (2023). Applications of Waiting Time Distributions of Compound Patterns in Quality Control. *Green Science & Technology Journal*, 13(2), 63-77. (National Taitung University, Taiwan)
8. Huang, Y. C., Combs, G. F., Jr, Wu, T. L., Zeng, H., & Cheng, W. H. (2022). Selenium status and type 2 diabetes risk. *Archives of biochemistry and biophysics*, 730, 109400. DOI: [10.1016/j.abb.2022.109400](https://doi.org/10.1016/j.abb.2022.109400)
9. Ying-Chen Huang, Tung-Lung Wu, Huawei Zeng, and Wen-Hsing Cheng (2021). Dietary Selenium Requirement for the Prevention of Glucose Intolerance and Insulin Resistance in Middle-aged Mice. *The Journal of Nutrition*, 151(7), 1894-1900.
10. Tung-Lung Wu and Ping Li (2020). Projected Tests for High-Dimensional Covariance Matrices, *Journal of Statistical Planning and Inference*, 207, 73-85.
11. G. Li, Y. Zhao, J. L. Purswell, G. D. Chesser Jr, J. W. Lowe, T.-L. Wu (2020). Effects of antibiotic-free diet and stocking density on male broilers reared to 35 days of age. Part 2: feeding and drinking behaviours of broilers, *Journal of Applied Poultry Research*, 29, 391-401.
12. Tung-Lung Wu (2020). Conditional Waiting Time Distributions of Runs and Patterns and

Their Applications, *ANNALS OF THE INSTITUTE OF STATISTICAL MATHEMATICS*.
DOI: [10.1007/s10463-018-0696-3](https://doi.org/10.1007/s10463-018-0696-3)

13. Tung-Lung Wu (2020). Boundary Crossing Probabilities for Jump Diffusion Processes to Time-Dependent Boundaries, *Methodology and Computing in Applied Probability*. DOI: [10.1007/s11009-018-9685-5](https://doi.org/10.1007/s11009-018-9685-5)
14. Tung-Lung Wu (2018). A note on Erdős and Kac's identity: boundary crossing probability of Brownian motion to constant boundary, *Methodology and Computing in Applied Probability*. DOI: [10.1007/s11009-018-9686-4](https://doi.org/10.1007/s11009-018-9686-4)
15. Xue Zhang, Yan Campbell, Jasmine Hendrix, Thomas Phillips, Jerome Goddard, Wen-Hsing Cheng, Taejo Kim, Tung-Lung Wu, M. Wes Schilling (2018). Biology and integrated pest management of *Tyrophagus putrescentiae* (Schrank) infesting dry cured hams, *Journal of Stored Products Research*, 79, 16-28.
16. Lei Cao, Li Zhang, Huawei Zeng, Ryan T.Y. Wu, Tung-Lung Wu, Wen-Hsing Cheng (2017). Effects of Sex, Aging, and Long-term Dietary Selenium Deprivation on Selenotranscriptome and Selenium Content in Telomere Dysfunctional Mice. *Journal of Nutrition*, 147(10):1858-1866. (2016 IMPACT FACTOR: 4.145)
17. Tung-Lung Wu (2017). Approximations of distributions of scan statistics of nonhomogeneous Poisson processes, *Journal of Statistical Planning and Inference*, 190, 52-59.
18. James C. Fu and Tung-Lung Wu. (2016). Boundary crossing probabilities for high-dimensional Brownian motion. *Journal of Applied Probability*, 53, 543-553
19. Tung-Lung Wu and Joseph Glaz (2015). A New Adaptive Procedure for Multiple Window Scan Statistics. *Computational Statistics & Data Analysis*, 82, 164-172
20. Tung-Lung Wu, Joseph Glaz and James Fu (2013). Discrete, Continuous and Conditional Multiple Window Scan Statistics. *Journal of Applied Probability* 50, 1089-1101.
21. Yu-Fei Hsieh and Tung-Lung Wu (2013). Recursive Equation in Finite Markov Chain Imbedding. *Annals of the Institute of Statistical Mathematics* 65, 513-527
22. Tung-Lung Wu. (2013). On Finite Markov Chain Imbedding Technique and Its Applications. *Methodology and Computing in Applied Probability* 15, 453-465.
23. James C. Fu, Tung-Lung Wu and W. Y. Wendy Lou (2012). Continuous, discrete and conditional scan statistics. *Journal of Applied Probability*, 49, 199-209.
24. Yung-Ming Chang and Tung-Lung Wu. (2011). On Average Run Lengths of Control Charts for Autocorrelated Processes. *Methodology and Computing in Applied Probability*, 13, 419-431.
25. James C. Fu and Tung-Lung Wu. (2010). Linear and Non-Linear Boundary Crossing Probabilities for Brownian Motion and Related Processes. *Journal of Applied Probability*, 47, 1058-1071.

* Corresponding author

PROFESSIONAL SERVICE

Advisor of Taiwanese Student Association at MSU, 2016 - present

Meeting Organizer and Session Chairs:

- Scientific program committee member and session organizer for International Workshop on Applied Probability (IWAP) 2016 and 2025

Referee/Reviewer:

Statistica Sinica

Communications in Statistics – Theory and Methods

IEEE Transactions on Information Theory
 Statistics and Probability Letters
 Journal of Statistical Physics
 Statistical in Medicine
 Journal of the Royal Statistical Society
 Methodology and Computing in Applied Probability
 Journal of Applied Probability
 Statistical Methods and Applications
 Quality and Reliability Engineering International

TEACHING EXPERIENCE

Instructor

STAT 8413 Multivariate Statistical Methods, Mississippi State University
 STAT 8613 Linear Models, Mississippi State University
 STAT 6573. Introduction to Mathematical Statistics II, Mississippi State University
 STAT 6213 Nonparametric Methods, Mississippi State University
 STAT 8114 Statistical Methods, Mississippi State University
 STAT 4875 Nonparametric Statistical Methods, University of Connecticut
 STAT 5005 Introduction to Applied Statistics, University of Connecticut
 STAT 3025Q Statistical Methods (twice), University of Connecticut
 STAT 1000 Basic Statistical Analysis (four times), University of Manitoba
 STAT 1501 Elementary Biological Statistics, University of Winnipeg

PRESENTATIONS

1. 2026 SSC Annual Meeting, Hamilton, Ontario, 5/31-6/3, 2026
Invited talk: First-Passage-Time Distributions of Scan Statistics with Applications to CNV Detection
2. 2025 International Workshop on Applied Probability, Raleigh, NC, June 9-13, 2025
Invited talk: Cluster Detection Using Scan Statistics for Nonhomogeneous Poisson Processes in High Dimensions
3. 2023 AECT international convention, Orlando, FL, October 16-20, 2023
Examining Students' Learning Styles and Performances for Multimedia Design Projects
4. National Dong Hwa University, Hualien, Taiwan, May 12, 2023.
Invited talk: A Forensic Statistical Analysis of the Federal Food Stamp Program.
5. National Cheng Kung University, Tainan, Taiwan, April 20, 2023.
Invited talk: A Forensic Statistical Analysis of the Federal Food Stamp Program.
6. 2022 Joint Statistical Meetings, August 6 – August 11 Washington, DC.
Scan Statistics on Nonhomogeneous Poisson Processes with Application in Copy Number Variation
7. EcoSta_2022, June 4 – June 6, Kyoto, Japan
Cluster Detection Using Scan Statistics for High Dimensional Nonhomogeneous Poisson Process
8. Mathematics Colloquium, University of Louisiana at Lafayette, November 1, 2018
Invited talk: Projected Tests for High-Dimensional Covariance Matrices
9. 2018 AECT international convention, Kansas City, MO, October 23-27, 2018
ICEM Roundtable-Is there any relationship between students' learning styles and class performances for multimedia project design?
10. International Conference on Mathematics and Statistics (ICOMAS 2018), May 7 – 10, 2018

- Invited talk: Distribution-Free Control Charts Based on Runs and Patterns
11. 2017 Joint Statistical Meetings, July 29 - August 3 Baltimore, MD.
Conditional Waiting Time Distributions of Runs and Patterns and Their Applications
 12. Statistics Seminar, University of Mississippi, April 24, 2017
Tests for High-Dimensional Covariance Matrices Using Random Matrix Projection
 13. International Workshop on Applied Probability, June 20-23, 2016
Invited talk: Approximations of Distributions of Scan Statistics of Inhomogeneous Poisson Processes
 14. Statistics Seminar, National Cheng Kung University, June 11, 2015
Invited talk: Tests for High-Dimensional Covariance Matrices Using Random Matrix Projection
 15. National Taitung University, May 18, 2015
Invited talk: Study abroad
 16. Fourth International Workshop in Sequential Methodologies, July 18 -21, 2013
Invited talk: A new adaptive procedure for multiple window scan statistics
 17. ICSA Symposium, June 9-12, 2013
Invited talk: Multiple window scan statistic and its application
 18. The 27th New England Symposium, April 27, 2013, University of Connecticut
Contributed paper: A new adaptive procedure for multiple window scan statistics
 19. 2012 Joint Statistical Meetings, July 28 - August 2 at San Diego, CA.
Contributed paper: Parameter estimation following a group sequential test: a likelihood ratio estimator
 20. The 7-th Cross-strait Symposium in Statistics & Probability and 2010 CIPS Annual Meetings, May 1 – 2, 2010 at National Dong Hwa University/Taiwan
Contributed paper: On Approximating Distributions of Scan Statistics.
 21. FU-FEST 2009 - A symposium in honour of James C. Fu at University of Manitoba
Invited talk: Linear and nonlinear boundary crossing probabilities for Brownian motion and related processes.
 22. Probability Seminar, June 15, 2009 at Institute of Mathematics, Academia Sinica/Taiwan
Invited talk: Linear and nonlinear boundary crossing probabilities for Brownian motion and related processes.
 23. Joint Meeting of the Statistical Society of Canada and the Société Française de Statistique, May 25 – 29, 2008 at Ottawa Congress Centre
Contributed paper: Finite Markov Chain Imbedding and Its Application to Matching Probability between Two Markov Dependent Biological Sequences.
 24. The 15th South Taiwan Statistics Conference June 24 – 25, 2006 at National Sun Yat-Sen University/ Taiwan
Contributed paper: Interval estimates for probabilities or parameters of a waiting time of runs and patterns associated with observed sequences of multi-state trials based on finite Markov chain imbedding approach.

AWARDS/HONORS/FELLOWSHIPS/GRANTS

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| 2025 | NSF (pending)
Project Title: High-Dimensional Pattern Detection and Boundary Crossing Problems Using Markov Chains
Award Amount: \$263,876
Period: 7/1/26 – 6/30/29
My role: PI |
| 2025 | Simon Foundation (pending) |

	Project Title: High-Dimensional Pattern Detection and Boundary Crossing Problems
	Award Amount: \$42,000
	Period: 9/1/2026 – 8/31/2031
2025	Engagement Scholarship Consortium (ESC) grant (not funded)
	Application titled: Fast Detection of Spatial Clusters in Nonhomogeneous Poisson Fields via Dimensional Reduction.
	Award Amount: \$5,000
2025	A&S Strategic Research Initiative (SRI) (not funded)
	Project Title: High-Dimensional Pattern Detection and Boundary Crossing Problems Using Markov Chains
	Award Amount: \$10,000
2024-2027	NSF
	Project Title: REU Site: Computational Methods with applications in Materials Science
	Award Amount: \$441,923
	Period: 4/1/2024 – 3/31/2027
	My role: senior personnel (mentor)
2020-2023	NSF
	Project Title: REU Site: Computational Methods with applications in Materials Science
	Award Amount: \$310,000
	Period: 4/1/2020 – 3/31/2023
	My role: senior personnel (mentor)
2018-2021	NIH R15 Grant
	Project Title: Optimized Selenium Intake, Gut Microbiota, and Diabetes
	Award Amount: \$421,185
	Period: 9/1/18 – 8/31/21
	My role: co-PI, \$28,612
	Credit: 7%
2014-2015	International Working Group Grant, co-PI, \$4,000, Mississippi State University
2014-2015	Cross-College Research Grant, PI, \$2,000, Mississippi State University
2013	Outstanding Research by a Graduate Student, University of Manitoba
2007-2010	University of Manitoba Graduate Fellowship (UMGF)
2008-2009	International graduate student scholarship (IGSS)
2008, 2010	Travel Awards to Ottawa (2008) and Taiwan (2010) to attend conferences

PHD STUDENT:

Asanka Duwage (Statistics, 2021-)

Tockie Hemphill (Food Science, Nutrition and Health Promotion, 2023-2026)

MASTER STUDENTS:

Geophrey Odera (statistics, 2015)

Jingjing Wang (statistics, 2016)

Lihong Wang (statistics, 2016)

Yiyuan Ma (statistics, 2017)

Yang-Chih Tsao (Food Science, Nutrition & Health Promotion, 2017, co-supervisor)

Shimeng Ma (Statistics, 2018)

Zheng Cao (Statistics, 2019)
Yixuan Wen (Statistics, 2019)
Aditya Ketkar (Statistics, 2020)
Xue Zhang (Statistics, 2022)
Osei Ampong (Statistics, 2025-present)