

Wei Ning, Ph.D.

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<https://www.researchgate.net/profile/Wei-Ning-15/>

EDUCATION

- **Syracuse University, Syracuse, NY, USA**
PhD in Statistics Aug 2006
Advisor: Prof. Hyune-Ju Kim
- **Syracuse University, Syracuse, NY USA**
MA in Statistics Aug 2002
- **University of Science and Technology of China, Hefei, P.R.China.**
BS in Mathematics July 1999
BA in Statistics and Finance July 1999

RESEARCH INTERESTS

Change Point Analysis, Sequential Analysis, High-dimensional Data Analysis, Empirical Likelihood, Survival Analysis, Causal Inference, Meta Analysis, Machine Learning, Time Series Analysis.

PROFESSIONAL EXPERIENCES

- **Professor of Research Excellence** May 2023 - Present
Department of Mathematics and Statistics
Bowling Green State University, Bowling Green, OH
- **Professor** May 2018 - Present
Department of Mathematics and Statistics
Bowling Green State University, Bowling Green, OH
- **Associate Professor** May 2012 - May 2018
Department of Mathematics and Statistics
Bowling Green State University, Bowling Green, OH
- **Assistant Professor** Aug 2006 - May 2012
Department of Mathematics and Statistics
Bowling Green State University, Bowling Green, OH
- **Visiting Associate Professor** Aug 2013 - Sept 2014
Department of Biostatistics
University of Michigan, Ann Arbor, MI

- **Visiting Associate Professor** Aug 2013 - Sept 2014
Department of Statistics
University of Michigan, Ann Arbor, MI
- **Graduate Teaching Assistant** Sept 2000 - May 2006
Department of Mathematics
Syracuse University, Syracuse, NY

RESEARCH GRANTS

- Simons Foundation, Mathematics and Physical Sciences-Collaboration Grants for Mathematicians. PI. *Empirical-Likelihood-Based Sequential Change point Detection Methods for High Dimensional Data*. \$42,000. 9/2020-9/2025.
- 1-year Research Incentive Grant, Bowling Green State University. PI. *A New Change Point Model Approach for Detection of DNA Copy Number Variations in aCGH Data*. \$10,000. 9/2009-9/2010.
- 1-year Research Incentive Grant, Bowling Green State University. PI. *Topics of the Generalized Lambda Distribution Family*. \$10,000. 9/2008-9/2009.
- 1-year Research Incentive Grant, Bowling Green State University. PI. *A New Approach to Study of the Statistical Epistasis between Genes*. \$10,000. 9/2007-9/2008.

ARTICLES IN PEER REVIEWED JOURNALS

- [84] Yang, J., Tian, W, Tian, C., Li, S. and **Ning, W.** (2024). Empirical likelihood method for detecting change points in network autoregressive models *AIMS Mathematics*. Accepted.
- [83] Li, S., Tian, W., Li, X. and **Ning, W.** (2024). Confidence intervals for heterogeneity in meta-analysis of the rare binary events based on empirical likelihood-type methods. *CIS-Simulation and Computation*. In press.
- [82] Li, M., **Ning, W.** and Tian, Y. (2024). Change Point Test for Length-biased Lognormal Distribution under Random Right Censoring. *Mathematics*. 12(11), 1760.
- [81] Sharghi, S., Stoll, K. and **Ning, W.** (2024). Statistical inferences for missing response problems based on modified empirical likelihood. *Statistical Papers*. In press.
- [80] Li, S., Tian, W., Li, X. and **Ning, W.** (2024). Confidence intervals for heterogeneity in meta-analysis of the rare binary events based on empirical likelihood-type methods. In press. *Communications in Statistics-Simulation and Computation*. (Accepted in 2023)
- [79] Wang, P. and **Ning, W.** (2024). Nonparametric Shiryaev-Roberts Change-point Detection Procedures Based on Modified Empirical Likelihood. In press. *Journal of Applied Statistics*. <https://doi.org/10.1080/02664763.2024.2307532> (Accepted in 2023)
- [78] Li, M., Ratnasingam, S., Tian, Y.B. and **Ning, W.** (2024). Change point detection in length-biased lognormal distribution. *CIS-Simulation and Computation*. In press.
- [77] Wang, J. and **Ning, W.** (2024). Change point detection in length-biased Weibull distribution for random censored data based on modified information criterion. *Journal of Statistical Theory and Practice*. 18(3), 37.

- [76] Wang, J. and **Ning, W.** (2023). Change-point detection of the Kumaraswamy skew-t distribution based on a modified information criterion. Under revision. *Journal of Applied Statistics*.
- [75] Wang, P. and **Ning, W.** (2023). Nonparametric CUSUM Change-point Detection Procedures Based on Modified Empirical Likelihood. Under revision. *Computational Statistics*.
- [74] Njuki, J. and **Ning, W.** (2023). Energy-statistic Based modified information criterion for detecting change in distribution. Under review. *Journal of Applied Statistics*.
- [73] Ratnasingam, S., Piyadi Gamage, R.D. and **Ning, W.** (2023). Empirical Likelihood Based Nonparametric Methods for One and Two-Sample U-Statistics. Under review. *Pakistan Journal of Statistics*.
- [72] Liu, T., Tian, W. and **Ning, W.** (2023). Sequential probability ratio test for zero inflation in counting data. *CIS-Simulation and Computation*. 52(4), 1344-1360.
- [71] Tian, W., Pang, L., Tian, C. and **Ning, W.** (2023). Change point analysis for Kumaraswamy distribution. *Mathematics*. 11(3), 553.
- [70] Li, T., Tian, W. and **Ning, W.** (2022). Jackknife empirical likelihood for the mean of a zero-and-one inflated population. *Communications in Statistics-Theory and Methods*. In press.
- [69] Ratnasingam, S. and **Ning, W.** (2023). Change Point Detection in Linear Failure Rate Distribution Under Random Censorship. *Journal of Statistical Theory and Practice*. 17(1), 1-21.
- [68] Wang, P. and **Ning, W.** (2022). Sequential Change Point Detection for Skew Normal Distribution. *Sequential Analysis*. 41(3), 387-415.
- [67] Li, T., Tian, W. and **Ning, W.** (2024). Jackknife empirical likelihood for the mean of a zero-and-one inflated population. *Communications in Statistics-Theory and Methods*. 53(3), 980-994.
- [66] Li, M., Tian, Y.B. and **Ning, W.** (2023). Modified information criterion for detecting changes in skew slash distribution. In press. *ROSE*. <https://doi.org/10.1515/rose-2023-2011>.
- [65] Li, M., Ratnasingam, S. and **Ning, W.** (2022). Empirical-likelihood-Based Confidence Intervals for Quantile Regression Models with Longitudinal Data. *Journal of Statistical and Computation*. 92(12), 2536-2553.
- [64] Ratnasingam, S. and **Ning, W.** (2023). Confidence Intervals of Mean Residual Life function in Length-biased Sampling Based on Modified Empirical Likelihood. *Journal of Biopharmaceutical Statistics*. 33(1), 114-129.
- [63] Ratnasingam, S., Buzaianu, E. and **Ning, W.** (2022). Modified Information Criterion for Testing Changes in Generalized Lambda Distribution Model Based on Confidence Distribution. *Communications for Statistical Applications and Methods*. 29(3), 301-317.
- [62] Stewart, P., **Ning, W.** (2021). Empirical-likelihood-based hypothesis tests for the means of two zero-inflated populations. In press. *CIS-Simulation and Computation*.
- [61] Ratnasingam, S. [†], **Ning, W.** (2021). Monitoring Sequential Structural Changes in Penalized High-Dimensional Linear Models. *Sequential Analysis*. 40(3), 381-404.

- [60] Li, X., Tian, W. and **Ning, W.** (2021). Sequential Probability Ratio Test for the Skew Slash Distribution. *International Journal of Intelligent Technologies & Applied Statistics*. 14(1).
- [59] Ratnasingam, S. [†], **Ning, W.** (2021). Change Point Detection in Three Parameter Weibull Distribution Based on Modified Information Criterion. *Environmental and Ecological Statistics*. 28(2), 303-322.
- [58] Ratnasingam, S. [†] and **Ning, W.** (2021). Sequential Change Point Detection for High-Dimensional Data using Non-convex Penalized Quantile Regression. *Biometrical Journal*. 63(3), 575-598.
- [57] Piyadi Gamage, R.D.[†], **Ning, W.** (2021). Empirical Likelihood for Change Point Detection in Autoregressive Models. *Journal of the Korean Statistical Society*. 50(1), 69-97.
- [56] **Ning, W.** and Wu, Y. (2021). Estimation of Common Change Point and Isolation of Changed Panels after Sequential Detection. *Journal of Statistical Theory and Practice*. 15(1).
- [55] Stewart, P.[†], **Ning, W.** (2020). Confidence Intervals for Data Containing Many Zeros and Ones Based on Empirical-Likelihood-Type Methods. *Journal of Statistical Computation and Simulation*. 90(18), 3376-3399.
- [54] Ratnasingam, S. [†], **Ning, W.** (2020). The Lomax-Linear Failure Rate Distribution. *Far East Journal of Theoretical Statistics*. 59(1), 35-58.
- [53] Wang, T., Tian, W. and **Ning, W.** (2020). Likelihood ratio test change-point detection in the skew slash distribution. In press. *CIS-Simulation and Computation*.
- [52] Stewart, P.[†], **Ning, W.** (2020). Confidence Intervals for Data Containing Many Zero Observations Based on Empirical-Likelihood-Type Methods. *Computational Statistics*. 35, 2019–2042
- [51] Ratnasingam, S. [†], **Ning, W.** (2020). Confidence Distributions for Skew Normal Change-point Model Based on Modified Information Criterion. *Journal of Statistical Theory and Practice*. 14(3), 1-21.
- [50] Piyadi Gamage, R.D. and **Ning, W.** (2020). Inference for Short-memory Time Series Models Based on Modified Empirical Likelihood. *Australian & New Zealand Journal of Statistics*. 62(3), 322-339.
- [49] Piyadi Gamage, R.D. and **Ning, W.** (2020). Inference for Long-memory Time Series Models Based on Modified Empirical Likelihood. *Austrian Journal of Statistics*. 49(5), 68-79.
- [48] Opperman, L. [†], **Ning, W.** (2020). Goodness-of-Fit Test for Skew Normality Based on Energy Statistics. *Random Operators and Stochastic Equations*. 28(3), 227-236
- [47] Opperman, L. [†], **Ning, W.** (2021). Sequential Probability Ratio Test for the Skew Normal Distribution. *CIS-Simulation and Computation*. 50(10), 2823-2836.
- [46] Cai, X.[†], Tian, Y.B. and **Ning, W.** (2019). Change-point Analysis of the Failure Mechanisms Based on Accelerated Life Tests. *Reliability Engineering & System Safety*. 188, 515-522.
- [45] Chen, Y.J. and **Ning, W.** (2019). Modified Information Criterion in Detecting Change Points in Exponential-Logarithmic Distribution. *Communications in Statistics-Simulation and Computation*. 48(7), 1996-2003.

- [44] Basalamah, D.[†], Said, K.K., **Ning, W.** and Tian, Y.B. (2018). Modified Information Criterion for Linear Regression Change-point Model with Its Applications. In press. *Communications in Statistics–Simulation and Computation*.
- [43] Alghamdi, A.[†], **Ning, W.** and Gupta, A.K. (2018) Statistical Inference for the Transformed Rayleigh Lomax Distribution with Progressive Type-II Right Censorship. *Electronic Journal of Applied Statistical Analysis*. 12(1), 209-222.
- [42] Alghamdi, A.[†], **Ning, W.** and Gupta, A.K. (2018). An Information Approach for the Change Point Problem of the Rayleigh Lomax Distribution. *International Journal of Intelligent Technologies and Applied Statistics*. 11(4), 233-254.
- [41] Basalamah, D.[†], **Ning, W.** and Gupta, A.K. (2018). The Beta Skew-t Distribution and Its Properties. *Journal of Statistical Theory and Practice*. 12(4), 837-860.
- [40] Said, K.K.[†], **Ning, W.** and Tian, Y.B. (2017). Modified Information Criterion for Testing Changes in Skew Normal Model. *Brazilian Journal of Probability and Statistics*. 33(2), 280-300.
- [39] Said, K.K.[†], **Ning, W.** and Tian, Y.B. (2017). Detecting Changes in Linear Regression Model with Skew Normal Errors. *Random Operators and Stochastic Equations*. 26(1), 1-10.
- [38] Said, K.K.[†], Basalamah, D.[†], **Ning, W.** and Gupta, A.K. (2017). The Kumaraswamy Skew-t Distribution and Its Related Properties. *Communications in Statistics–Simulation and Computation*. 47(8), 2409-2423.
- [37] Piyadi Gamage, R.D.[†], **Ning, W.** and Gupta, A.K. (2017). Adjusted Empirical Likelihood for Long-memory Time Series Models. *Journal of Statistical Theory and Practice*. 11(1), 220-233.
- [36] Piyadi Gamage, R.D.[†], **Ning, W.** and Gupta, A.K. (2017). Adjusted Empirical Likelihood for Time Series Models. *Sankhya B*. 79(2), 336-360.
- [35] Cai, X.[†], Tian, Y.B. and **Ning, W.** (2017). Modified Information Approach for Detecting Two Change Points in Piecewise Linear Failure Rate Function. *Statistics & Probability Letters*. 125, 130-140.
- [34] Chen, Y.J.[†] and **Ning, W.** (2017). Tests for Smooth-Abrupt Changes with Applications. *Electronic Journal of Applied Statistical Analysis*. 10(1), 194-205.
- [33] Said, K.K.[†], **Ning, W.** and Tian, Y.B. (2017). Likelihood Procedure for Testing Changes for Skew Normal Model With Application to Stock Returns. *Communications in Statistics–Simulation and Computation*. 46(9), 6790-6802.
- [32] Chen, Y.J.[†], **Ning, W.** and Gupta, A.K. (2016). Empirical Likelihood Based Detection Procedure for Change Point in Mean Residual Life Functions Under Random Censorship. *Pharmaceutical Statistics*. 15, 246-254.
- [31] Cai, X.[†], Said, K.K.[†] and **Ning, W.** (2016). Change-point Analysis with Bathtub Shape for the Exponential Distribution *Journal of Applied Statistics*. 43(15), 2740-2750.
- [30] Chen, Y.J.[†], **Ning, W.** and Gupta, A.K. (2017). Jackknife Empirical Likelihood Test for Equality of Two Mean Residual Functions. *Communications in Statistics-Theory and Methods*. 46(7), 3111-3122. Accepted in 2015.

- [29] **Ning, W.** (2015). Probabilistic Representations of Matrix Variate Skew Normal Models. *Random Operators and Stochastic Equations*, 23(1), 21-29.
- [28] **Ning, W.**, Yeh, A. B., Wu, X.Q. and Wang, B.X. (2015). Distribution-Free Phase I Control Charts for Individual Observations Based on Empirical Likelihood Ratio. *Quality and Reliability Engineering International*, 31(1), 37-55.
- [27] Ngunken, G.[†] and **Ning, W.** (2015). Changepoint Detection Model based on Skew-Normal distributions for aCGH Data. *Journal of Computations & Modelling*, 5(2), 75-87.
- [26] Chen, Y.J.[†], **Ning, W.** and Gupta, A.K. (2014). Jackknife Empirical Likelihood Methods on Testing for Equality of Variances of Two Samples. *Journal of Applied Statistics*, 42(1), 144-160.
- [25] Hasan, A.[†], **Ning, W.** and Gupta, A.K. (2014). An Information Based Approach to Detecting the Change Point Under the non-central Skew t Model. *Sequential Analysis*, 33, 458-474.
- [24] Ngunken, G.[†] and **Ning, W.** (2014). Information Approach for the Change Point Detection in the Skew Normal Distribution and Its Applications. *Sequential Analysis*, 33, 475-490.
- [23] Wu, X.Q., Zhang, S.G. and **Ning, W.** (2014). Empirical Likelihood Ratio Based Test for Change Point Detection in Linear Regression Model. *Acta Mathematicae Applicatae Sinica (English series)*. Accepted.
- [22] **Ning, W.** (2014). Empirical Likelihood Ratio Based Goodness-of-Fit Test for Generalized Lambda Distribution. *European Journal of Pure and Applied Mathematics*, 7 (1), 22-36.
- [21] Su, S., Hasan, A.[†] and **Ning, W.** (2013). The RS Generalized lambda based calibration model. *International Journal of Statistics and Probability*, 2(1), 101-107.
- [20] Zhao, H., Chen, H. and **Ning, W.** (2013). Changepoint Analysis by Modified Empirical Likelihood Method in Two-Phrase Linear Regression Models. *Open Journal of Applied Sciences*, 3(1B), 1-6.
- [19] Gupta, A.K., Aziz, M.A. and **Ning, W.** (2013). On Some Properties of the Unified Skew Normal Distribution. *Journal of Statistical Theory and Practice*, 7, 480-495.
- [18] **Ning, W.** and Ngunkeng, G. (2013). An Empirical Likelihood Ratio Based Goodness-of-Fit Test for the Skew Normality. *Statistical Methods and Applications*, 22, 209-226.
- [17] Zhang, H.H., Jing, H.F., **Ning, W.** and Gupta, A.K. (2013). Edgeworth Expansion of the Moment-based Test for Homogeneity in the Mixture NEF-QVF family. *Communications in Statistics-Simulation and Computation*, 42(10), 2281-2294.
- [16] Li, H.[†] and **Ning, W.** (2012). Multiple Comparisons with a Control Under Heteroscedasticity. *Journal of Applied Statistics*, 39(2), 2275-2283.
- [15] **Ning, W.** (2012). Empirical bayes method on changepoints estimation of tumor growth profiles in xenograft experiments. *Journal of Applied Statistical Science*. 19(2), 105-115.
- [14] Yan, C.J., Zhang, S.G. and **Ning, W.** (2012). Estimations of the Improper Linear Regression Models with Complex-valued Data. *Journal of The Graduate University of Chinese Academy of Sciences*, 29(2), 146-153.

- [13] **Ning, W.** (2012). The Empirical Likelihood Ratio Test for a Mean Change Point Model with a Linear Trend Followed by an Abrupt Change. *Journal of Applied Statistics*. **39**(5), 947-961.
- [12] **Ning, W.** and Gupta, A.K. (2012). Matrix Variate Extended Skew Normal Distributions. *Random Operators and Stochastic Equations*. **20**(4), 299-310.
- [11] **Ning, W.**, Pailden, P. and Gupta, A.K. (2011). The Empirical Likelihood Ratio Test for the Epidemic Change Point Model. *Journal of Data Science*. **10**, 107-127.
- [10] **Ning, W.**, Gao, Y. C, and Dudewicz, E. J. *Chapter 8: Fitting Mixture Distributions Using A Mixture of Generalized Lambda Distributions with Computer Code*. Book chapter of Handbook of Fitting Statistical Distributions with R (Ed. by Duedewicz, E.J. and Karian, Z.A.). Publishing date: October 1, 2010. Boca Raton, FL: CRC Press.
- [9] Zhang, S.G., Liao, Y. and **Ning, W.** (2010). Asymptotic Properties of Quasi-Maximum Likelihood Estimates in Generalized Linear Models. *Communication in Statistics–Theory and Methods*. **40**, 4417-4430.
- [8] **Ning, W.** and Zhao, L. (2010). A Moment-based Test for the Mixture Distributions With Small Sample Sizes and Its Application. *Far East Journal of Theoretical Statistics*. **33**(1), 23-39.
- [7] **Ning, W.**, Gupta, A. K., (2009) Change Point Analysis For Generalized Lambda Distributions. *Communications in Statistics-Simulation and Computation*. **38**, 1789-1802.
- [6] **Ning, W.**, Zhang, S. G. and Yu, C. (2009). A Moment-Based Test for the Homogeneity in Mixture Natural Exponential Family with Quadratic Variance Functions. *Statistics and Probability Letters*. **79**(6), 828-834.
- [5] **Ning, W.**, Gupta, A. K., Yu., C. and Zhang, S. G., (2009). A Moment-Based Test for Homogeneity in Finite Mixture Models. *Communication in Statistics–Theory and Methods*. **38**, 1371-1382.
- [4] **Ning, W.**, Gao, Y. C, and Dudewicz, E. J., (2008). Fitting Mixture Distributions Using Generalized Lambda Distributions and Comparisons with Normal Mixtures. *American Journal of Mathematical and Management Science*. Vol. 28, NOS. 1&2, 81-99.
- [3] **Ning, W.** and Kim, H. J., (2008). Residual Pattern Based Test for Interaction in Two-way ANOVA. *Biometrical Journal*, **50**(3), 431-445.
- [2] **Ning, W.**, (2008). Detecting an Unconditionally Identifiable Pattern in Two-way ANOVA. *Advances and Applications in Statistics*. **9**(2), 247-260.
- [1] **Ning, W.**, (2007). A Moment-based Test of Genetic Linkage Under Heterogeneity. *JP Journal of Biostatistics*, **1**(3), 267 - 281.

STUDENTS SUPERVISED

- Dissertations

1. **Hong Li**, Ph.D. in statistics, 8/2007-9/2009. BGSU.
 Dissertation: *Multiple Comparison Under Unequal Variances And Its Application To Dose Response Studies*.
 Current position: Professor, Department of Mathematics, Cameron University, Oklahoma.
2. **Grace Ngunkeng**, Ph.D. in statistics, 8/2010-8/2013. BGSU.
 Dissertation: *Statistical Analysis of the Skew Normal Distribution and Its Applications*.
 Current Position: Associate Professor, Department of Mathematics, Kent State University, OH.
 Past Position: Assistant Professor, School of Mathematics and Computer Science, Lake Superior State University, MI.
3. **Abeer Hasan**, Ph.D. in statistics, 8/2010-8/2013. Co-advised. BGSU.
 Dissertation: *A Study of Skew t Distribution with Applications*.
 Current Position: Associate Professor, Department of Mathematics and Statistics, North Carolina Agricultural and Technical State University, NC.
 Past Position: Associate Professor, Department of Mathematics, Humboldt State University, CA.
4. **Ying-ju Chen**, Ph.D. in statistics, 8/2012-8/2015. Co-advised. BGSU.
 Dissertation: *Jackknife Empirical Likelihood and Change Point Problems*.
 Current Position: Associate Professor, Department of Mathematics, University of Dayton, OH.
 Past Position: Visiting Assistant Professor, Department of Information & Analytics, Farmer School of Business, Miami University, OH.
5. **Ramadha Dilhani Piyadi Gamage**, Ph.D. in statistics, 8/2014-8/2017. Co-advised. BGSU.
 Dissertation: *Empirical Likelihood for Change Point Detection and Estimation in Time Series Models*.
 Current Position: Associate Professor, Department of Mathematics, Western Washington University, WA.
6. **Doaa A Basalamah**, Ph.D. in statistics, 8/2014-8/2017. Co-advised. BGSU.
 Dissertation: *Statistical Inference for a New Class of Skew- t Distribution and Its Related Properties*.
 Current Position: Assistant Professor, Mathematical Science Department, Umm Al Qura University, Mecca, Saudi Arabia.
7. **Xia Cai**, Ph.D. in statistics, 8/2014-8/2017. Co-advised. Beijing Institute of Technology, China.
 Dissertation: *A Study on Change-point Problem Based on Reliability Characteristic Quantities*.

Current Position: Associate Professor, School of Science, Hebei University of Science and Technology, Shijia Zhuang, China.

8. **Khamis Said**, Ph.D. in statistics, 8/2014-8/2017. Co-advised. Beijing Institute of Technology, China.

Dissertation: *Change Point Analysis in Skew Normal Model with Applications.*

Current Position: Instructor, Department of Mathematics, Karume institute of Science and Technology, Zanzibar, Tanzania.

9. **Amani Alghamdi**, Ph.D. in statistics, 1/2015-5/2018. BGSU. **Dissertation:** *Study of Generalized Lomax Distribution and Change Point Problem.*

Current Position: Assistant Professor, Department of Statistics, Science College, King Abdulaziz University, Saudi Arabia.

10. **Logan Opperman**, Ph.D. in statistics, 8/2017-8/2019. BGSU.

Dissertation: *Sequential Inference and Nonparametric Goodness-of-Fit Tests for Certain Types of Skewed Distributions.*

Current Position: Teaching Assistant Professor, Department of Statistics, North Carolina State University, NC.

11. **Patrick Stewart**, Ph.D. in statistics, 1/2018-5/2020. BGSU.

Dissertation: *Statistical Inferences on Inflated Data Based on Modified Empirical Likelihood.*

Current Position: Assistant Professor, Department of Mathematics, Millersville University, PA.

12. **Suthakaran Ratnasingam**, Ph.D. in statistics, 8/2018-5/2020. BGSU.

Dissertation: *Sequential Change-point Detection in Linear Regression and Linear Quantile Regression Models Under High Dimensionality.* **2020 BGSU Graduate College Distinguished Dissertation.**

Current Position: Assistant Professor, Department of Mathematics, California State University, San Bernardino, CA.

13. **Sima Sharghi**, Ph.D. in statistics, 1/2018-8/2021. BGSU.

Dissertation: *Statistical Inferences for Missing Data/Causal Inference Based on Modified Empirical Likelihood.*

Current Position: Postdoc, Department of Biostatistics and Computational Biology, University of Rochester Medical Center.

14. **Joseph Njuki**, Ph.D. in statistics, 1/2020-5/2022. BGSU.

Dissertation: *Energy-Statistics-Based Nonparametric Methods for Change Point Analysis.*

Current Position: Assistant Professor, Department of Mathematics, Coastal Carolina University, SC.

15. **Peiyao Wang**, Ph.D. in statistics, 8/2020-5/2022. BGSU.

Dissertation: *Sequential Change Point Analysis for skew Normal Distributions and Empirical-Likelihood-Based CUSUM and SR Procedures.*

Current Position: Postdoc, Division of Biostatistics, Department of Population Health, New York University Langone Health, NY.

Past Position: Postdoc, Division of Biostatistics, School of Public Health, University of Minnesota, MN.

16. **Bradley Craig**, Ph.D. in statistics, 1/2020-8/2023. BGSU.

Dissertation: *Sequential Inference and Goodness of Fit Testing Using Energy Statistics for the Power Normal and Modified Power Normal Distributions.*

17. **Mei Li**, Ph.D. in statistics, 8/2019-6/2023. Co-advised. Beijing Institute of Technology.

Dissertation: *A study on change-point test for based on several lifetime and degradation models.*

Current Position: Assistant Professor, Department of Mathematics, Kunming University of Science and Technology, China.

18. **Ebun Dosumu**, Ph.D. in statistics, 8/2024-current. BGSU.

• **Master Thesis**

1. **Tao Jiang**, 8/2013-8/2015.

Thesis: *Information approach for change point detection of Weibull models with applications*

2. **Matthew Kovach**, 8/2017-9/2018.

Thesis: *Causal inference of human resource key performance indicators.*

3. **Richard Copper**, 9/2019-7/2020.

Thesis: *Change point analysis for lognormal distribution based on Schvarcz information criterion.*

4. **Austin Hadamuscin**, 1/2021-5/2022.

Thesis: *Information Approach to change point analysis and its application to fiscally standardized cities*

5. **Deep Sagar Karki**, 5/2021-5/2022.

Thesis: *Modified information criterion for change point detection with its application to linear regression models.*

6. **Ryan Jarrell**, 8/2022-8/2023.

Thesis: *Change point analysis for the log skew slash distribution.*

TEACHING EXPERIENCE

1. Undergraduate Courses

- **BGSU: Fall 2006 - Fall 2024**

Course Number	Course Title	Terms
MATH 2220	Discrete Mathematics, online course	3
STAT 2110	Elementary Statistical Methods	1
MATH 1150	Introduction to Statistics I	4
MATH 1350	Calculus and Analytic Geometry	1
MATH 2220	Discrete Mathematics	4
MATH 2470	Fundamental Statistics	1
MATH 2470	Fundamental Statistics-remote	1
MATH 3220	Discrete Mathematics	3
MATH 3320	Elementary Linear Algebra	4
MATH 3410	Principles of Probability and Statistics	4

- **Syracuse University: Fall 2000 - Spring 2006**(recitations)

Course number	Course Title	Terms
MAT 211-212	Elementary Prob. and Stat. I & II	8
MAT 285	Calculus	6

2. Undergraduate-Graduate Courses

- **BGSU: Fall 2006 - Fall 2024**

Course Number	Course Title	Terms
MATH 4470/5470	Exploratory Data Analysis, online course	6
MATH 4320/5320	Linear Algebra and Its Applications	1
MATH 4410/5410	Probability and Statistics I	4
MATH 4420/5420	Probability and Statistics II	4
STAT 4410/5410	Applied Nonparametric Statistics	1
STAT 4160/5160	Time Series Analysis	1

3. Graduate Courses (MATH 6820 is a topic statistics course)

- **BGSU: Fall 2006 - Fall 2024**

Course Number	Course Title	Terms
MSA 5160	Time Series Analysis and Forecast	2
MSA 5470	Exploratory Data Analysis	2
MSA 6450	Advanced Data Analysis (online)	1
MATH 5470	Exploratory Data Analysis	2
MATH 6410	Probability Theory I	5
MATH 6420	Probability Theory II	5
MATH 6410	Probability Theory I-remote	1
MATH 6420	Probability Theory II-remote	1
MATH 6450	Advanced Data Analysis	2
MATH 6460	Nonparametric Statistical Inference	5
MATH 6480	Bayesian Decision Theory	1
MATH 6500	Statistical Consulting	1
MATH 6720	Biostatistical Methods	2
MATH 6820	Empirical Likelihood Analysis	1
MATH 6820	Changepoint Analysis and Its Applications	1
MATH 6820	Causal Inference	3
MATH 7400	Multidimensional Analysis	1
MATH 7450	Advanced Mathematical Statistics I	2
MATH 7460	Advanced Mathematical Statistics II	2

CURRICULUM DEVELOPMENT

- Graduate Topic Courses, BGSU.
 - ◇ MATH 6820 Topics in Statistics-Introduction to causal inference (Summer 2024; 10 students)
 - ◇ MATH 6820 Topics in Statistics-Causal inference and applications (Summer 2023; 11 students)
 - ◇ MATH 6820 Topics in Statistics-Causal inference (Spring 2022; 9 students)
 - ◇ MATH 6820 Topics in Statistics-Sequential analysis (Summer 2017; 9 students)
 - ◇ MATH 6820 Topics in Statistics-Casual inference (Fall 2016; 29 students)
 - ◇ MATH 6820 Topics in Statistics-Changepoint analysis and its applications (Summer 2014; 8 students)
 - ◇ MATH 6820 Topics in Statistics-Empirical likelihood analysis (Summer 2010; 18 students)
 - ◇ MATH 6500 Topics in Statistics-Statistical Consulting (Summer 2009; 12 students)
- Reading Courses, BGSU.
 - ◇ MATH 6700 Advanced Readings in Statistics-Sequential Changepoint Analysis (Spring 2024)
 - ◇ MATH 6700 Advanced Readings in Statistics-Empirical Likelihood (Spring 2018)
 - ◇ MATH 6700 Advanced Readings in Statistics-Casual Inference and Its Applications (Spring 2018)
 - ◇ MATH 6700 Advanced Readings in Statistics-Sequential change-point analysis (Fall 2015 & 2016; Spring 2016)
 - ◇ MATH 6700 Advanced Readings in Statistics-Nonparametric methods for change-point analysis (Fall 2015)
 - ◇ MATH 6700 Advanced Readings in Statistics-Asymptotic minimax theory and sequential change-point analysis (Fall 2015)
 - ◇ MATH 6700 Advanced Readings in Statistics-Change-point analysis for incomplete data (Fall 2015)
 - ◇ MATH 6700 Advanced Readings in Statistics-Skew normal distribution and its related family (Fall 2014)
 - ◇ MATH 6700 Advanced Readings in Statistics-Sequential Analysis (Fall 2014)
 - ◇ MATH 6700 Advanced Readings in Statistics-Meta analysis in medical research II (Summer 2012)
 - ◇ MATH 6700 Advanced Readings in Statistics-Meta analysis in medical research I (Spring 2012)
 - ◇ MATH 6700 Advanced Readings in Statistics-Empirical likelihood method in time series analysis (Fall 2011)
 - ◇ MATH 6700 Advanced Readings in Statistics-Generalized lambda distribution and data fitting (Summer 2011)
 - ◇ MATH 6700 Advanced Readings in Statistics-Empirical likelihood method of Change point analysis (Spring 2011)
 - ◇ MATH 6700 Advanced Readings in Statistics-Change point analysis (Spring 2009)
 - ◇ MATH 6700 Advanced Readings in Statistics-Statistics in genetics (Fall 2008)

INVITED TALKS

1. Nonparametric Shiryaev-Roberts Change-point Detection. *The 7th International Conference on Econometrics and Statistics, Beijing, China.* July 19-22, 2024.
2. Nonparametric Shiryaev-Roberts Change-point Detection. *The 8th International Workshop in Sequential Methodologies, Utah Valley University, Utah.* May 21-24, 2024.
3. Confidence Distributions for Skew Normal Change Point Model Based on Modified Information Criterion. *Journal of Statistical Theory and Practice webinars seminar,* August 24, 2023.
4. Confidence intervals of mean residual life function in length-biased sampling based on modified empirical likelihood. *School of Mathematics and Statistics, Beijing Institute of Technology,* July 26, 2023. (virtually)
5. Confidence intervals of mean residual life function in length-biased sampling based on modified empirical likelihood. *Department of Applied Mathematics, School of Science, Xi'an University of Technology,* July 11, 2023. (virtually)
6. Monitoring sequential structural changes in penalized high-dimensional linear models. *International Chinese Statistical Association China Conference, Chengdu, China,* June 29-July 4, 2023.
7. Monitoring sequential structural changes in penalized high-dimensional linear models. *Department of Mathematics, College of Big Data and Internet, Shenzhen Technology University,* June 15, 2023. (virtually)
8. Confidence intervals of mean residual life function in length-biased sampling based on modified empirical likelihood. *Department of Mathematics, School of Science, Hebei University of Science and Technology,* May 10, 2023. (virtually)
9. Monitoring Sequential Structural Changes in Penalized High-Dimensional Linear Models. *International Conference on Advances in Interdisciplinary Statistics and Combinatorics, Greensboro, NC.* October 7-9, 2022.
10. Confidence Intervals of Mean Residual Life Function in Length-Biased Sampling Based on Modified Empirical Likelihood. *5th International Conference on Econometrics and Statistics, Ryukoku University, Kyoto, Japan.* June 4-6, 2022. (Virtually)
11. Monitoring sequential structural changes in penalized high-dimensional linear models. *Department of Statistics, University of Akron.* October 6, 2021.
12. Matrix variate extended skew normal distributions. *Spring Research Conference, Oakland University, MI.* May 20-22, 2020.
13. *School of Mathematics and Statistics, Beijing Institute of Technology University, Beijing, China.*
 - (a) Empirical Likelihood for Change Point Detection in Autoregressive Models.. June 25, 2019.
 - (b) Sequential Change Point Detection Procedure for High-Dimensional Data via SCAD Penalty. July 2, 2019.
14. Empirical Likelihood for Change Point Detection in Autoregressive Models. *ICSA 2019 Applied Statistics Symposium, Rayleigh, NC.* June 9-12, 2019.
15. Empirical Likelihood Based Detection Procedure for Change Point in Mean Residual Life Functions under random censorship. *Department of Biostatistics and Epidemiology, University of Pennsylvania, Philadelphia.* October 6, 2015.

16. Empirical Likelihood Based Detection Procedure for Change Point in Mean Residual Life Functions under random censorship. *Fifth International Workshop in Sequential Methodologies, Columbia University, NYC*. June 22-24, 2015.
17. Change-point Analysis Workshop (including six serial lectures). *Invited. School of Mathematics and Statistics, Beijing Institute of Technology University, Beijing, China*. May 5-May 16, 2014.
18. Information Approach for the Change Point Detection in the Skew Normal Distribution and Its Applications. *Fourth International Workshop in Sequential Methodologies, University of Georgia, Athens, Georgia*. July 18-21, 2013.
19. Empirical likelihood ratio test for the mean change-points with linear trend followed by abrupt change. *IMS-China International Conference on Statistics and Probability, Chengdu, P. R. China*. June 30-July 4, 2013.
20. A New Approach of Non-central Skew t Distribution and Its Applications. *Department of Statistics, Nankai University, Tianjing, China*. June 21, 2013.
21. *School of Mathematics and Statistics, Beijing Institute of Technology University, Beijing, China*.
 - (a) Empirical Likelihood Ratio Test for the Mean Change-Points with Linear Trend Followed by Abrupt Change. June 18, 2013.
 - (b) Information Approach for the Change Point Detection in the Skew Normal Distribution and Its Applications. June 19, 2013.
22. Empirical Likelihood Method for the Mean Change Point Model. *Invited colloquium talk, Department of Mathematics and Statistics, Oakland University, Rochester, MI*. November, 2012.
23. An Empirical Likelihood Ratio Based Goodness-of-Fit Test for Skew Normality. *Invited colloquium talk, Department of Mathematical Sciences, Indiana University-Purdue University at Indianapolis*. November, 2011.
24. The Empirical Likelihood Ratio Test for the Mean Change Points with the Linear Trend Followed by Abrupt Change. *Third International Workshop in Sequential Methodologies, Stanford, CA*. June 14-16, 2011.
25. A Moment-based Test for the Mixture Distributions With Small Sample Sizes and Its Application. *The Fourth International Conference on Neural, Parallel & Scientific Computations, Atlanta, GA*. August 11-14, 2010.
26. *Graduate University of Chinese Academy of Science, Beijing, China*.
 - (a) A Generalized Lambda Distribution (GLD) Change Point Model For the Detection of DNA Copy Number Variations in Array CGH Data. June 23, 2009.
 - (b) A Moment-based Test for the Homogeneity in Mixture Natural Exponential Family with Quadratic Variance Functions. June 24, 2009.
27. The Change point Problems of The Generalized Lambda Distributions. *Department of Mathematics, University of Mississippi, February, 2008*.

PROFESSIONAL DEVELOPMENT

- [18] Serve the guest editor of *Journal of Statistical Theory and Practice* for the topic collection of **Skew normal distribution and related topics**, 2024.
- [17] Wrote a recommendation letter for Dr. Wei Zheng for the promotion to associate professor, Department of Mathematics and Statistics, Texas A& M University-Corpus Christi, 2024.

- [16] Wrote a recommendation letter for Dr. Yongli Sang for the promotion to associate professor, Department of Mathematics, University of Louisiana, 2023.
- [15] Wrote a recommendation letter for Dr. Chaeryon Kang for the promotion & tenure to associate professor, Department of Biostatistics, University of Pittsburgh, 2023.
- [14] Served as a session chair in the 2023 International Chinese Statistical Association conference, Chengdu, China, June 29-July 4, 2023.
- [13] Served as an NSF-AMPS panel reviewer. May 3-5, 2023.
- [12] Wrote a recommendation letter for Dr. Lan Gao for the promotion to full professor, Department of Mathematics, The University of Tennessee at Chattanooga, 2023.
- [11] Wrote a recommendation letter for Dr. Ngoc Nguyen for the promotion to full professor, Department of Mathematics, Western Kentucky University, 2022.
- [10] Wrote a recommendation letter for Dr. Yonggang Lu for the promotion to associate professor, Business school, University of Maine, 2022.
- [9] Wrote a recommendation letter for Dr. Xuwen Zhu for the promotion to associate professor, Department of Information Systems, Statistics, and Management Science, the Culverhouse College of Business, The University of Alabama, 2021.
- [8] Wrote a recommendation letter for Dr. Nao Mimoto for the promotion to associate professor, Department of Statistics, The University of Akron, 2017.
- [7] Wrote a recommendation letter for Dr. Ngoc Nguyen for the promotion to associate professor, Department of Mathematics, Western Kentucky University, 2015.
- [6] Wrote a recommendation letter for Dr. Yonggang Lu for the promotion to associate professor, College of Business and Public Policy, University of Alaska Anchorage, 2013.
- [5] NSF proposal reviewer. "Development of Nonparametric Univariate and Multivariate CUSUM Control Charts using Sequential Normal Scores for Detecting Structural Changes in Economic Series". November, 2019.
- [4] Served as a group member for Bowling Green State University, Ohio Council of Teachers of Mathematics (OCTM) Mathematics Tournament. February 2014-2016.
- [3] Served as the site director for Bowling Green State University, Ohio Council of Teachers of Mathematics (OCTM) Mathematics Tournament. February 2011-2014.
- [2] Serve as the chair of the nonparametric session in the Joint Statistical Meetings. Miami beach, FL, July 30-August 4, 2011.
- [1] Serve as a session chair in the 8th Annual Hawaii International conference on Statistics, Mathematics, and Related fields. Honolulu, Hawaii. January, 2009.

REVIEWER FOR THE JOURNALS

- Serve as a referee of journals
 - * *Vaccines*
 - * *npj Vaccines*
 - * *Entropy*
 - * *Journal of Big Data*
 - * *Statistical Papers*
 - * *Annals of the Institute of Statistical Mathematics*
 - * *Journal of Applied Statistics*
 - * *Journal of Adolescent Health*

- * *Mathematics - MDPI*
- * *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*
- * *Test*
- * *Symmetry*
- * *PLOS ONE*
- * *Biometrics*
- * *Statistics*
- * *Environmetrics*
- * *Science China Mathematics*
- * *The Computer Journal*
- * *Journal of Statistical Computation and Simulation*
- * *American Journal of Mathematical and Management Science*
- * *Electronic Journal of Statistics*
- * *Communications in Statistics-Theory and Methods*
- * *Communications in Statistics-Simulation and Computation*
- * *Statistics and Its Interface*
- * *Journal of Applied Probability and Statistics*
- * *Applied Mathematics and Computation*
- * *Journal of Statistical Theory and Practice*
- * *IET Radar, Sonar & Navigation*
- * *The American Statistician*
- * *Journal of Nonparametric Statistics*
- * *International Journal of Probability and Statistics*
- * *International Journal of Biostatistics*
- * *Statistics Research Letters*
- * *Sequential Analysis*
- * *Statistics in Medicine*
- * *Statistical Methodology*
- * *Statistics & Probability Letters*
- * *Sankhya B*
- * *Random Operators and Stochastic Equations*
- * *Quality Technology & Quantitative Management*
- * *Annals of the Brazilian Academy of Sciences*
- * *Advances and Applications in Statistics*
- * *Computational Statistics and Data Analysis*
- * *Bulletin of the Malaysian Mathematical Sciences Society*
- * *Scientific Reports*
- * *The Computer Journal*
- * *Journal of Mathematical Research with Applications*
- * *Research in Mathematics*
- Serve as a reviewer for the books (manuscripts and proposals)
 - ◇ Book proposal review. *Empirical Likelihood Method in Survival Analysis, 2nd edition* by Mai Zhou, University of Kentucky. Chapman & Hall/CRC Press: Boca Raton, FL. 2024.
 - ◇ Book chapter review. *The Joy of Statistics: Learning Statistics with Real World Data.* by Chris P. Tosokos & Rebecca D. Wooten, University of South Florida, Tampa, FL. 2010.
 - ◇ Book chapters review. *Applied Probability and Statistics* by Arnold Barnett, Massachusetts Institute of Technology, Boston, MA. John Wiley & Sons. 2011.

- ◇ Book review. *Probability with Statistical Applications, 2nd Edition* by Rinaldo B. Schinazi, University of Colorado, Colorado Springs, CO. Birkhäuser: Boston. 2011.
- ◇ Book proposal review. *Empirical Likelihood Method in Survival Analysis* by Mai Zhou, University of Kentucky. Chapman & Hall/CRC Press: Boca Raton, FL. 2011.
- ◇ Book chapter review (four chapters). *Empirical Likelihood Method in Survival Analysis* by Mai Zhou, University of Kentucky. Chapman & Hall/CRC Press: Boca Raton, FL. 2014.
- Editorships of Journals
 - ◇ Associate Editor. Journal of Statistical Theory and Practice, 2024-present.
 - ◇ Associate Editor. Sequential Analysis, 2024-present.
 - ◇ Member of Editorial board. JP Journal of Biostatistics, June 2010-present.
 - ◇ Member of Editorial board. Advances and Applications in Statistics. 2013-present.
 - ◇ Member of Editorial board. Far East Journal of Probability Theory and Statistics. 2015-present.
- Reviewer of *Mathematical Reviews*, 2013-2018.

SERVICES

A. Department

- ◇ Writing and Grading Master's Comprehensive Exams
 - MATH 6410 & 6420: June 2007, 2008, 2009, 2010, 2011, 2012 2014, 2015, 2017, 2018, 2019, 2020 and September 2012 and 2015.
 - MATH 6460: March 2016; June 2017, 2018; June 2024.
- ◇ Writing and Grading PhD Preliminary Exams
 - MATH 7450 & 7460: August 2007, 2008, 2009, 2010, 2016, 2017, 2018, 2020 and 2024.
 - MATH 7480: August 2017.
- ◇ Advising of graduate students.
 - 2007 (14), 2008 (13), 2009 (13), 2010 (15), 2011 (31), 2012(26), 2014(17), 2015(10),2016(15), 2017(15), 2018(14), 2019 (32), 2020-present (31).
- ◇ Statistics Committee, Fall 2006-present.
- ◇ Graduate Advisor in Statistics, 2007-2012; Fall 2018; Fall 2019-present.
- ◇ Statistics Program Committee, Fall 2007-Spring 2013; Spring 2017; Fall 2018; Fall 2019-present.
- ◇ Merit Committee, Fall 2011-Spring 2012; Fall 2016-Spring 2017; Fall 2018; Fall 2024-present.
- ◇ Statistics Program Committee, Fall 2007-Spring 2013; Spring 2017; Fall 2018; Fall 2019-present.
- ◇ Graduate Committee, Fall 2018; Fall 2024-present.
- ◇ Graduate Recruiting/Admission Team, Fall 2007-Spring 2011; 2023-present.
- ◇ Undergraduate Committee, Fall 2011-Spring 2013; Fall 2014-Spring 2015; Fall 2016.

- ◇ Undergraduate Coordinator, Fall 2012-Spring 2013; Spring 2017.
- ◇ Advisory committee. Spring 2024.
- ◇ Graduate Exam Coordinator. 2020-2022.
- ◇ Department Colloquium Committee , Fall 2009-Spring 2010, Fall 2011-Spring 2012, Fall 2015 (chair)-Spring 2016 (chair); Fall 2016 (chair)-Spring 2017; Fall 2018 (chair).
- ◇ 3320 Coordinator, Spring 2018-Spring 2022..
- ◇ 2470/3410/4410/4420 Coordinator, Fall 2016-Spring 2022.
- ◇ Family Campaign Representative, Fall 2009-Spring 2010.
- ◇ Library Committee. Fall 2015-Spring 2016 (chair).
- ◇ Education Adviser, Fall 2007-Spring 2011.
- ◇ Putnam Team, Fall 2008-Spring 2010.
- ◇ Tenure-Track Faculty Teaching Evaluations
 - Peng Wang (2013)
 - Xiangdong Xie (2012)
- ◇ Instructors Teaching Evaluations
 - Xiaofeng Zhang (2018)
 - Irina Franke (2015)
 - Anna Kasikova (2013)
 - Daria Filippova (2013, 2017)
 - Ann Darke (2012)
 - Cheryl Grant (2012)
 - A.J. Wilhelm (2012)
 - Michelle Heckman (2011)
 - Sandra Zirkes; Diane Mott (2008)

B. College

- ◇ A& S Curriculum, Teaching, & Learning Committee (CTLTC), Spring 2016.

C. University

- ◇ Judge of Shanklin Colloquium and Awards, April 2018.
- ◇ STEMS Day 2017 Talk: *Mathematics & Statistics: “A Math major: Jobs and Opportunities*, November 9, 2017.
- ◇ Attended calculus group meeting on retention (calculus in life sciences) by Dr. Theresa Farnum, April 20, 2017.
- ◇ Attended faculty annual review workshop. March 21, 2017.
- ◇ Judge of the Graduate Student Senate Research Assistant Award. Spring, 2017.
- ◇ Represented Department of Mathematics and Statistics at 2017 BGSU Presidents’ Day, February 20, 2017.
- ◇ Attended Undergraduate Council meeting for the first reading of the proposal of new course MATH099 as Department Undergraduate Coordinator, February 15, 2017.

- ◇ Attended Undergraduate Council meeting for the second reading of the proposal of Data Science Minor as Department Undergraduate Coordinator, February 1, 2017.
- ◇ Attended calculus group meeting on retention (calculus in life sciences) by Dr. Theresa Farnum, January 25, 2017.
- ◇ Represented Department of Mathematics and Statistics at BGSU Preview Day.
 - December 3, 2016; December 5, 2015.
 - December 6, 2014; April 26, 2014.
 - April 20, 2013; December 1, 2012.
- ◇ STEMS Day 2012 Talk: *Mathematician, Statistician, and Actuarial Scientist: The three top-rated jobs in America*, November 30, 2012.
- ◇ Graduate Council, Spring 2010; Fall 2011-Spring 2011.
- ◇ Member of Equal Opportunity Compliance Committee Fall 2009-Spring 2010.
- ◇ Attended the University Library Meeting, 09/18/08.
- ◇ Attended the 6th and 7th Educator Preparation Summits, 2007 & 2008.

TECHNICAL SKILLS

- Operating Platforms: Windows.
- Statistical Software
 - Beginner: Python, SAS
 - Advanced: R, Minitab, SPSS
- Application: L^AT_EX, GitHub.