Elvin Y. Tseng

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Education

National Tsing Hua University (NTHU), Taiwan *Sept. 2021 - June 2023*
M.S. in Statistics
Thesis: Change-point detection EWMA control charts for monitoring Weibull scale parameter
Advisor: Prof. Longcheen Huwang

National Tsing Hua University (NTHU), Taiwan *Sept. 2017 - June 2021*
B.S. in Mathematics

Research Interests

Statistical Methodologies

- Statistical Process Control (SPC)
- Compressed Sensing, Information Theory

Machine Learning

- Secure Federated Learning
- Optimization-Based Machine Learning Theory

Publication

Ciou, S. C., Chen, P. J., **Tseng, E. Y.**, and Lee, Y. J. (2023). *Federated Learning for Sparse Principal Component.* Accepted by IEEE Big Data 2023 arXiv:2311.08677.

Research Experiences

Research Assistant *Aug. 2023 - present*
Research Center for Information Technology Innovation, Academia Sinica *Taipei, Taiwan*

- Advisor: Prof. Yuh-Jye Lee
- Topic: Trustworthy AI/Privacy-preserving federated learning
- Utilized cryptography techniques in federated learning framework to defend against several malicious attacks
- Developed secure federated nonlinear SVM (Support Vector Machine) and SVR (Support Vector Regression) with MPC (Multi-Party Computation) and homomorphic encryption techniques to enhance data privacy

Graduate Research Assistant *Feb. 2022 - July 2023*
Institute of Statistics, NTHU *Hsinchu, Taiwan*

- Advisor: Prof. Longcheen Huwang
- Topic: Monitoring Weibull lifetime with limited (or no) Phase I in-control data
- Developed statistical process control methods using likelihood ratio test statistics to concurrently monitor processes and detect change-points without preliminary data
- Proposed techniques demonstrated 8-36% improvement compared to previous methods from literature that lacked simultaneous monitoring and change-point identification capabilities

Summer Research Assistant *July 2021 - Sept. 2021*
Institute of Statistics, NTHU *Hsinchu, Taiwan*

- Topic: Determined optimal control limits for SREWMA control chart through extensive statistical simulation
- Leveraged C++ and parallel computing in R to optimize simulation processes and reduce computational time
- Results published in *Quality and Reliability Engineering International*

Undergraduate Research Assistant *Jan. 2021 - May 2021*
Institute of Statistical Science, Academia Sinica *Taipei, Taiwan*

- Advisor: Prof. Jeng-Min Chiou
- Topic: Estimation and testing of intensity functions for spatial inhomogeneous Poisson point processes
- Reviewed parametric and nonparametric estimation methods along with hypothesis testing techniques for intensity functions and similarity assessment of point processes

Work Experiences

Graduate Teaching Assistant
Department of Mathematics & Institute of Statistics, NTHU

- STAT5561 Quality Control (graduate level) *2022 Fall*
- MATH2820 Statistics *2022 Spring, 2023 Spring*
- MATH2810 Probability Theory *2021 Fall*

Honors & Awards

Academic Excellence Scholarship *2021 Fall, 2022 Spring*
Institute of Statistics, NTHU

5th Graduate Research Symposium - Outstanding Poster Award *June 2023*
National Central University *Taoyuan, Taiwan*

Chinese Statistical Association Thesis Award - Honorable Mention *2023*
Chinese Statistical Association (Taiwan) *Taipei, Taiwan*

DEI Efforts

Volunteered Data Analyst of Data for Social Good (D4SG) Project *Apr. - July 2023*
DSP, Inc. *Taipei, Taiwan*

- Topic: Analyzing data of elderly individuals living alone in Pingtung County
- Cooperated with government officials to analyze the home visit reports and established systematic data processing scheme to assist them in crafting intelligent public policies
- Presented at *D4SG Fellowship Project Symposium*

Programming Skills

Language	R, Python, Matlab, C/C++
Toolkit	R Shiny/Markdown, PyTorch, TensorFlow

Last revised in *Dec. 2023*