

ZHEXUAN YANG

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Education

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| Northern Illinois University <i>PhD in Mathematics Science (Concentration: Statistics)</i> | Aug. 2019 – May 2025 <i>DeKalb, Illinois</i> |
| Anhui University of Science and Technology <i>Bachelor of Science in Applied Statistics</i> | Sep. 2013 – Jun. 2017 <i>Anhui, China</i> |

Experience

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| Assistant Teaching Professor <i>The Pennsylvania State University</i> | July. 2025 – Present <i>State College, Pennsylvania</i> |
| <ul style="list-style-type: none">Teaching course in statistics for undergraduate level student.Developed lecture material, homework, exams.Mentoring undergraduate students. | |
| Biostatistics Intern <i>Jefferson Health</i> | Jun. 2023 – Jul. 2023 <i>Philadelphia, Pennsylvania</i> |
| <ul style="list-style-type: none">Utilized Surveillance, Epidemiology, and End Results (SEER) Medicare database and performed survival analysis including Cox PH model with time-dependent covariates to assess whether patient metabolic co-morbidities (e.g., obesity and diabetes) and therapeutics (e.g., oral hypoglycemic agents and statins) have any significant associations with outcomes in patients with central nervous system tumors.Participated Sidney Kimmel Cancer Center's cancer trial protocol review session. | |
| Teaching Assistant <i>Department of Statistics, Northern Illinois University</i> | Aug. 2019 – Dec. 2024 <i>DeKalb, Illinois</i> |
| <ul style="list-style-type: none">Graded quizzes and homework for both graduate level and undergraduate level statistic courses.Ran recitation sessions to reinforce information taught in the classes and administered quizzes.Held office hours and tutoring sessions to assist students in need. | |
| Consulting Assistant <i>Department of Statistics, Northern Illinois University</i> | Aug. 2018 – May. 2024 <i>DeKalb, Illinois</i> |
| <ul style="list-style-type: none">Provided statistical consulting services to 20+ clients from both in-campus and off-campus students.Provided statistical consulting services to Chicago Pace Bus service.Provided statistical consulting services to Chicago Mercy Hospital. | |

Courses

Course Taught at the Pennsylvania State University:

- STAT 414: Introduction to Probability Theory (Fall 2025)
- STAT 416: Stochastic Modeling (Spring 2026)

Course Assisted at Northern Illinois University:

- STAT 100: Basic Statistics (Spring & Fall 2022, Spring & Fall 2023, Spring, Summer & Fall 2024)
- STAT 437: Categorical Data Analysis (Fall 2019)
- STAT 515: Computational Methods in Statistics (Fall 2021, Spring 2025)
- STAT 517: Statistical Learning (Fall 2019, Spring 2025)
- STAT 538: Time Series Analysis (Fall 2024)

Statistical Software

- alpmixBayes:** Bayesian Estimation for Alpha-Mixture Survival Models. *The Comprehensive R Archive Network R Project.* 2025 - now
- mmcmcBayes:** Multistage MCMC framework for differentially methylated regions detection. *The Comprehensive R Archive Network R Project.* 2025 - now

Publication

Article under review

- Yang, Z., Ryu, D., Luan, F. (2026). mmcmcBayes: Multistage MCMC approach for Detecting the Differentially Methylated Regions Using R. (*Preprint*)
- Yang, Z. and Ryu, D. (2024). Analysis of Longitudinal Data with Outcome-Dependent Discrete Follow-up Process.
- Yang, Z., Ryu, D. and Luan, F. (2024). Bayesian Multivariate Smoothing Spline for the Functional Clustering Analysis of Neural Activity.

Research

Outcome-Dependent Follow-up Study

- Proposed a follow-up process for discrete visit times with negative binomial regression under Bayesian framework of outcome dependent follow-up model.
- Applied the proposed the follow-up process model for the cardiotoxicity study and kidney function study.

DNA Methylation Analysis

- Constructed three-parameter skewed normal distribution and modified alpha-skew generalized normal distribution of modeling the DNA methylation level and proposed the Multistage MCMC within a comprehensive Bayesian framework to identify the differentially methylated genetic regions.
- Applied the proposed the model to 450K micro-array data set to identify the suspected gene symbol leading to lung cancer.

Multivariate Functional Clustering Analysis

- Constructed multivariate smoothing spline to model the neural activity in the brain of mice.
- Compared the multivariate smoothing spline with seemingly unrelated regression model.
- Constructed weighted distance matrix to perform the functional clustering analysis.

Bayesian Survival Analysis

- Constructed Bayesian α -mixture survival model.
- Developed `alpmixBayes` function for Bayesian alpha mixture survival models through CRAN

Conference

- “Analysis of longitudinal data with outcome-dependent discrete follow-up process” (poster). 32nd International Biometrics Conference (IBC), Atlanta, GA, December, 2024.
- “Bayesian Multivariate Smoothing Spline for the Functional Clustering Analysis of Neural Activity” (poster). ENAR 2025 Spring Meeting, New Orleans, Louisiana, March, 2025.

Mentorship

Schreyer Honors College

The Pennsylvania State University

- (Fall 2025) Ethan Sheaffer, STAT 414 Introduction to Probability Theory
- (Spring 2026) Daniel Brady, STAT 416 Stochastic Modeling
- (Spring 2026) Krishna Pagrut, STAT 416 Stochastic Modeling
- (Spring 2026) Andres Torres, STAT 416 Stochastic Modeling

Grant

- Travel Grant, Department of Statistics, Northern Illinois University, 2024
- Federal Grant, Higher Education Emergency Relief Fund, U.S. Department of Education, 2023

Service

- Graduate Student Council, Faculty Senate Meeting, Northern Illinois University.
- Non-tenure Promotion Committee, Committee Member, The Pennsylvania State University

Reward

- 2018-2019 Northern Illinois University, Department of Mathematical Sciences, *Certificate of Merit*.

Projects

Drug abuse study | *R, SAS*

- Performed three different methods (KM, Cox, AFT) on data of drug abuse study
- Utilized AIC values to determine the best survival model.

Ordinal logistic regression | *SAS, R*

- Performed ordinal logistic regression for both equal and unequal slope when the proportional odds assumption is not met.
- Interpreted the results based on the odds ratio.

Experiment design | *R, Python*

- Considered the error under various distributions when analyzing data from corn field experiments.
- Experiment included the specified fertilizer effect, column effect, and row effect.
- The normal and exponential distributions were considered for the error term.

Retrospective chart review analysis | *R*

- Using R to clean the data and perform the statistical analysis.
- Constructing contingency tables and performing binomial tests.

PCA and Sparse PCA | *R*

- Performed PCA and Sparse PCA to examined museum specimens of the pygmy marmoset to determine if there is one single species, or potentially two or more species.

COVID-19 Model Forecasting | *R, Python*

- Performed the PCA and negative binomial regression to do the model forecasting.
- Performed the time series analysis to forecast the daily cases.