Min Lin

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Education

- **University of Connecticut** — Storrs, CT, US
  Ph.D. in Statistics (GPA: 3.98/4.0) — *August 2025*
  - **Ph.D. Advisor**: Dr. Ming-Hui Chen
  M.S. in Biostatistics (GPA: 4.0/4.0) — *May 2021*
- **Xiamen University** — Xiamen, Fujian, CN
  B.B.A. in Accounting (Bachelor of Business Administration) — *June 2019*

Publications

- **Lin, M.**, Baron, E., Zhu, J., Tang, R., Lambert, E., and Chen, M.-H. (submitted). *Propensity-score integrated borrowing-by-parts power prior to leverage external control data for randomized controlled trials in rare diseases.*
- Foley, J., **Lin, M.**, Weidman, S., Cassone, J., Stalte, N., Marsicano, L., and Bugbee, G. (submitted). *Integrated plant management of Eurasian watermilfoil: The role of grass carp and drawdowns in Candlewood Lake, CT.*
- Chen, M.-H., Guan, Z., **Lin, M.**, and Sun, M. (2025). *Rejoinder: Power priors for leveraging historical data: Looking back and looking forward. Journal of Data Science*, **23**(1), 64–69. (Authors listed in alphabetical order.)
- Chen, M.-H., Guan, Z., **Lin, M.**, and Sun, M. (2025). *Power priors for leveraging historical data: Looking back and looking forward. Journal of Data Science*, **23**(1), 1–30. (Authors listed in alphabetical order.)
- Baron, E., **Lin, M.**, Zhu, J., Tang, R., and Chen, M.-H. (2024). *Enhancing randomized controlled trials: A Bayesian divide-and-conquer approach for borrowing external control data. Statistics in Biosciences.* DOI: https://doi.org/10.1007/s12561-024-09465-2

Experience

Research Fellow, Servier Pharmaceuticals, Boston, MA — *September 2022 — August 2025*

- Provide statistical insights for innovations and publications in a multidisciplinary team; lead weekly group meetings.
- Develop R Shiny dashboards to visualize simulation results, improving team decision-making.
- Build R packages to streamline propensity-score-based analysis in clinical trials and implement Bayesian sample size determination algorithms.

Honors and Awards

- Conference Participation Award, University of Connecticut, January 2025.
- Departmental Award for Best Performance in Biostatistics, September 2024.
- Poster Award at Statistics for Oncology Annual Symposium (Stat4Onc), May 2024.
- Departmental Service Award, September 2023.
- Poster Award at Statistics in Pharmaceuticals Conference (SIP), August 2023.
- Departmental Gottfried Noether Award for Excellence in Mathematical Statistics, September 2020.

Research Projects

My research experience spans interdisciplinary projects at the intersection of health, environmental science, and computational methods, with a strong focus on advanced statistical modeling and data analysis.

- Efficacy of winter drawdown and grass carp on Eurasian watermilfoil and associated macrophytes in Candlewood Lake, CT: A case study 2008–2024. (Collaborative project with the Connecticut Agricultural Experiment Station)
  - Provided evidence to inform the authority in Connecticut of a more efficient invasive plant management strategy by recommending an earlier start to the winter drawdown to maximize freezing days.
  - Facilitated interdisciplinary collaboration by effectively communicating key statistical concepts to ecologists and incorporating domain-specific assumptions.
  - Developed a cumulative link mixed model to assess plant abundance, adjusting for grass carp and drawdown effects while accounting for spatial and temporal correlations.
  - Quantified the impact of winter drawdown by integrating duration, elevation, and temperature data into the model. Estimated the impact of grass carp by modeling abundance through initial stocking numbers, annual attrition rates, and manual removals, and by calculating biomass based on age and abundance.
- Single-cell RNA-seq analysis in OPTN knocked out mouse of Paget's disease. (Collaborative project with Division of Orthodontics, College of Dentistry, Ohio State University)
  - Applied miloDE method to detect biologically meaningful differentially expressed genes between the knock-out and wild-type groups.
- Probabilistic multivariate time series forecasting on electricity datasets via normalizing flows.
  - Combined Gated Recurrent Units (GRU) with a parameterized 1D convolution kernel to efficiently capture both temporal dependencies and variable interactions.
  - Utilized Real-NVP as a conditional normalizing flow to learn the conditional distribution of future time steps given the current summary statistic.
  - Demonstrated superior forecasting performance and uncertainty quantification on the Electricity benchmark dataset compared to state-of-the-art methods.
- Bayesian design of superiority trials with historical information.
  - Developed a progressive Monte Carlo algorithm to efficiently determine the required sample size when designing a superiority trial with historical information.
  - Built an R package `DesignBPP` with a highly efficient C++ implementation, offering a user-friendly interface.
- Propensity-score integrated approaches to borrowing external information for randomized controlled trials: A review.
  - Built an R package `PSborrowing` that streamlines propensity-score-based analysis in clinical trials, providing a consistent interface for various methods.
  - Carried out extensive simulation studies with parallel computing.
- Single-cell RNA-seq clustering method with penalized negative-binomial distributions.
  - Employed an L_2-norm penalty to the negative binomial log-likelihood and solved the optimization problem with an EM algorithm.

Presentations

- Short courses and workshops
  - "Bayesian designs of clinical trials using historical data: From theory to practice," Short course at Statistics for Oncology Annual Symposium (Stat4Onc), Stanford University (May 18, 2025).
  - "R visualization with `ggplot2`," Joint Statistical Club, University of Connecticut (November 6, 2023).
  - "Introduction to R," Joint Statistical Club, University of Connecticut (October 23, 2023).
- Invited talks
  - "An overview of power priors: Enhancing decision making with historical data," Stanford CISD-Regeneron BDM Elite Forum, Regeneron Pharmaceuticals (June 20, 2025).
  - "BIG-SSD: Baseline design-initiated and prior-guided sample size determination," Statistics for Oncology Annual Symposium (Stat4Onc), Stanford University (May 17, 2025).
  - "Tools and methods for Bayesian divide-and-conquer external data borrowing in clinical trials," Duke Industry Statistics Symposium (DISS), Durham (April 10, 2025).
  - "Propensity-score integrated borrowing-by-parts power priors: Analysis, design, and interface," PharmaStat Monthly Symposium, Storrs (January 25, 2025).
  - "R shiny app demo: A Bayesian divide-and-conquer approach for using external control data in randomized controlled trials," UConn-Servier Annual Colloquium, Servier Pharmaceuticals, Boston (November 20, 2024).
  - "Propensity-score integrated Bayesian dynamic borrowing: Stratification and regression," Boehringer Ingelheim, Shanghai, (July 23, 2024).
  - "Propensity-score regression with the sequential borrowing-by-parts power prior," WNAR/IMS/Graybill Joint Conference, Colorado State University (June 12, 2024).
  - "Propensity-score regression with the borrowing-by-parts power prior," the 7th Symposium of the International Society for Biopharmaceutical Statistics (ISBS), Baltimore (March 8, 2024).
  - "Latest rare disease methodology," UConn-Servier Annual Colloquium, Servier Pharmaceuticals, Boston (November 20, 2023).
- Posters
  - "Propensity-score regression with borrowing-by-parts power priors with application to leveraging external control data in rare diseases," Statistics for Oncology Annual Symposium (Stat4Onc), Storrs (May 9, 2024).
  - "RNA-seq analysis of Gli1+ periodontal mesenchymal stem cells in periodontitis," IADR/AADOCR/CADR, New Orleans (March 14, 2024).
  - "Propensity-score regression with borrowing-by-parts power priors with application to leveraging external control data in rare diseases," Statistics in Pharmaceuticals Conference (SIP), Storrs (August 17, 2023).

Leadership

- **Inaugural President:** Joint Statistical Club, the ASA UConn Student Chapter, 2023–2024.
- **President:** Graduate Student Committee–Statistics, University of Connecticut, 2023–2024.

Service

- **Organizing Committee Member:** NESS-NextGen, 2023–2025. Joined biweekly meetings for organizing the 2023, 2024, and 2025 Data Science Day. On-site team leader in 2023, in charge of in-person venue AV and the virtual Whova platform.

- **Committee Member:** CLAS Graduate Student Advisory Committee, College of Liberal Arts and Sciences, University of Connecticut, 2023–2025.
- **Journal Referee:** npj Digital Medicine, 2025; Therapeutic Innovation & Regulatory Science, 2025; Journal of Computational and Graphical Statistics, 2024; Journal of the American Statistical Association, 2024.
- **Conference Volunteer:** ICSA Applied Statistics Symposium, 2025; New England Statistics Symposium (NESS), 2024; Statistics for Oncology (Stat4Onc), 2024; Pharmaceutical Data Science (PharmaDS), 2024; Statistics in Pharmaceuticals (SIP), 2023; Pfizer Colloquium, 2023; Dose Finding and Other Topics in Drug Development, 2023; New England Statistics Symposium (NESS), 2023.

Skills

- **Programming:** Proficient in R, C++, R Shiny, Julia, and Shell scripting. Hands-on experience with Python, PyTorch, TensorFlow, SAS, SQL, and Docker.
- **Other Skills:** High Performance Computing (HPC) and Linux. Experience with Git/GitHub, and cloud computing (e.g., AWS, Google Cloud).