

Yanwei (Yana) Jin

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Research Interests

Clinical prediction and causal inference for acute care, centered on **sepsis in the emergency department**: interpretable risk models that transfer across health systems without recalibration, guideline-grounded clinical decision support, and target-trial methods for treatment-effect heterogeneity. Secondary interest in **simulation modeling for drug overdose policy**, including microsimulation of naloxone distribution and its equity implications.

Education

University of Minnesota, Twin Cities	Minneapolis, MN, USA
<i>Ph.D. in Bioinformatics and Computational Biology (BICB)</i>	Sep 2026 – Present
Advisor: Dr. Feng Xie	
<i>Master of Science in Biostatistics (GPA: 3.8/4.0)</i>	Sep 2024 – Aug 2026
<i>Minor in Computer Science (GPA: 4.0/4.0)</i>	
Peking University	Beijing, China
<i>Bachelor of Science in Nursing</i>	Sep 2017 – Jul 2022

Research Experience

Graduate Research Assistant , Dr. Feng Xie Lab	University of Minnesota
<i>Department of Surgery</i>	Nov 2024 – Present

Built and maintain the lab's multi-site emergency department data infrastructure, harmonizing over **2.2 million encounters** from M Health Fairview (UMN), MIMIC-IV (BIDMC), and Stanford (MC-MED) into a shared analysis-ready cohort underlying the projects below.

- **ESRP (Emergency Sepsis Risk Prediction)**. Developed an interpretable point-based sepsis identification score from **10 triage-available variables** using the **AutoScore** framework, derived on 1.6 million ED visits across 11 M Health Fairview hospitals and externally validated on MIMIC-IV-ED and Stanford MC-MED, reaching **AUROC 0.838 and 0.892** at the two external sites against 0.636 and 0.697 for qSOFA, without site-specific retuning. First author; under revision at *eClinicalMedicine*; presented at AMIA 2025 (oral) and three other venues.
- **MultiDiseasePred**. Developed an interpretable **multi-task** model predicting nine acute and disposition outcomes at ED triage from twelve routinely recorded variables; externally validated at two independent sites **with no retraining or recalibration**; released as an open-source Python package. Co-first author; under review at *npj Digital Medicine*.
- **RADAR (multi-agent system for sepsis care)**. Building a guideline-grounded **multi-agent system** for the emergency sepsis pathway, in which control flow is specified as a decision graph executed in code rather than delegated to free-form model output, and every recommendation is constrained to trace back to a verbatim guideline statement (*Surviving Sepsis Campaign 2026*).
- **Causal inference for sepsis phenotyping and treatment-effect heterogeneity**. Developing a pre-registered pipeline that combines Gaussian mixture models for phenotype discovery with target-trial emulation, hourly sequential trial designs, and cross-fitted AIPW for effect estimation, using negative-control exposures to quantify the residual-confounding floor before any effect is interpreted.

Graduate Research Assistant , Dr. Xiao Zang Lab	University of Minnesota
<i>School of Public Health</i>	Nov 2024 – Present

- **Overdose microsimulation and naloxone distribution**. Building an **individual-level microsimulation** of opioid and stimulant overdose deaths, fitted with the **BayCANN** Bayesian calibration framework: calibrated to **SUDORS** records by race and region in Nevada (2019–2024) to quantify sources of disparity in overdose mortality, and applied in Massachusetts and Minnesota to evaluate community-based naloxone distribution strategies.
- **National overdose mortality trends**. Conducted **descriptive epidemiological analyses** of U.S. drug overdose mortality (1999–2023) by region, age, race, and drug type using CDC WONDER data, with **joinpoint regression** to assess post-2023 declines in national and subgroup rates. Two resulting papers published in 2026 as first and co-first author.

Research Assistant , Prof. Yuan-Ting Zhang Lab	COCHE, Hong Kong
<i>Full-time</i>	Jan 2023 – Aug 2024

- Developed the **McBP-Net** model for continuous cuff-less blood pressure estimation from multimodal physiological signals (ECG, PPG, IPG) with **IEEE Grade A** accuracy; co-first-author paper in *IEEE JBHI* and one granted Chinese patent.

Publications

Published / Accepted

1. **Y. Jin**, Z. Li, Q. Wu, B. D. L. Marshall, E. L. Crable, X. Zang. "US Drug Overdose Deaths Involving Stimulants Without Opioids Continued to Rise in 2024." *Addictive Behaviors Reports*, 2026;24:100743. DOI: [10.1016/j.abrep.2026.100743](https://doi.org/10.1016/j.abrep.2026.100743)
2. Z. Li*, **Y. Jin***, M. K. Smith, B. R. Schackman, E. L. Crable, C. N. Behrends, K. Wagner, A. Y. Walley, B. D. L. Marshall, X. Zang. "Higher Drug Overdose Mortality among Non-Hispanic Black Adults Aged 55 and Older in the U.S.: Analysis of National Death Records from CDC's WONDER Database (1999–2023)." *Drug and Alcohol Dependence Reports*, 2026;19:100423. DOI: [10.1016/j.dadr.2026.100423](https://doi.org/10.1016/j.dadr.2026.100423)
3. T. Xiang*, **Y. Jin***, Z. Liu, L. Clifton, D. A. Clifton, Y. Zhang, Q. Zhang, N. Ji, Y.-T. Zhang. "Dynamic Beat-to-Beat Measurements of Blood Pressure Using Multimodal Physiological Signals and a Hybrid CNN-LSTM Model." *IEEE Journal of Biomedical and Health Informatics*, 2025;29(8):5438–5451. DOI: [10.1109/JBHI.2025.3548771](https://doi.org/10.1109/JBHI.2025.3548771)
4. S. Zhou, W. Xie, J. Li, Z. Zhan, M. Song, H. Yang, C. Espinoza, L. Welton, X. Mai, **Y. Jin**, Z. Xu, Y.-H. Chung, Y. Xing, M.-H. Tsai, E. Schaffer, Y. Shi, N. Liu, Z. Liu, R. Zhang. "Automating Expert-Level Medical Reasoning Evaluation of Large Language Models." *npj Digital Medicine*, 2025. DOI: [10.1038/s41746-025-02208-7](https://doi.org/10.1038/s41746-025-02208-7)
5. T. Xiang, Z. Liu, **Y. Jin**, N. Ji, Y.-T. Zhang. "Wearables Cardiovascular Monitoring: Effects of Cold Pressor Test on Heart Rates Estimated From ECG, PPG, and IPG Signals." *Online Journal of Robotics & Automation Technology*, 2024. DOI: [10.33552/OJRAT.2024.02.000541](https://doi.org/10.33552/OJRAT.2024.02.000541)
6. H. Chen, L. Lyu, Z. Zeng, **Y. Jin**, Y.-T. Zhang. "Beat-to-Beat Continuous Blood Pressure Estimation with Optimal Feature Sets of PPG and ECG Using Deep Recurrent Neural Networks." *Vessel Plus*, 2023. DOI: [10.20517/2574-1209.2023.30](https://doi.org/10.20517/2574-1209.2023.30)
7. **Y. Jin**, H. Sun, Y. Ji. "Public Risk Perceptions and Coping Behaviors in Novel Coronavirus Pneumonia Outbreaks: A Systematic Review." *Chinese Journal of Nursing Education*, 2023.

Under Review

1. **Y. Jin**, Y. Wang, X. Huang, D. A. Wacker, M. A. Puskarich, F. Xie. "Development and Multicenter External Validation of a Data-Driven Scoring System for Early and Rapid Identification of Sepsis in Emergency Departments." *medRxiv*, 2025. DOI: [10.1101/2025.09.27.25336784](https://doi.org/10.1101/2025.09.27.25336784) (Under revision at *eClinicalMedicine*)
2. **Y. Jin***, K. Xu*, Y. Wang*, C. Chu, X. Mai, Z. Zhou, A. Meyer, Y. Chen, G. Saarunya, R. A. Dudley, N. E. Ingraham, D. A. Wacker, M. Lin, M. A. Puskarich, F. Xie. "MultiDiseasePred: An Interpretable Multi-Disease Risk Prediction Framework and Its Application for Early Risk Stratification in the Emergency Department." (Under review at *npj Digital Medicine*)

*co-first author

Patents

1. H. Chen, L. Lyu, L. Li, **Y. Jin**. *Model Training Method, Physiological Indicator Detection Method, Apparatus, and Electronic Device*. CN Patent CN119441860A, 2025. Machine learning-based physiological indicator detection using wearable devices; granted by the China National Intellectual Property Administration.

Presentations

1. **Y. Jin**, K. Xu, Y. Wang, M. A. Puskarich, F. Xie. "MultiDiseasePred: An Interpretable Multi-Disease Risk Prediction Framework and Its Application for Early Triage in the Emergency Department Across Clinical Sites." *Surgery Research Recognition Day*, University of Minnesota, 2026. **Oral Presentation**.
2. **Y. Jin**, Y. Wang, M. A. Puskarich, F. Xie. "Emergency Sepsis Risk Prediction Score for Early and Rapid Identification in the Emergency Department." *AMIA Annual Symposium*, 2025. **Oral Presentation**.
3. **Y. Jin**, Y. Wang, M. A. Puskarich, F. Xie. "Interpretable Sepsis Identification Score for Emergency Care." *Advances in Learning Health System Sciences Conference*, 2025. Poster Presentation.
4. **Y. Jin**, Y. Wang, M. A. Puskarich, F. Xie. "Sepsis Risk Prediction Using a Data-Driven Scoring System." *Surgery Research Recognition Day*, University of Minnesota, 2025. Short Oral Presentation.
5. **Y. Jin**, Y. Wang, M. A. Puskarich, F. Xie. "Development and Validation of an Interpretable Data-Driven Score for Early and Rapid Identification of Sepsis at the Emergency Department." *National Academy of Engineering (NAE) Regional Meeting*, 2025. Poster Presentation.

Awards and Honors

- **UMR Graduate Fellowship**, University of Minnesota Rochester, Bioinformatics and Computational Biology program (2026–2027). Sole recipient in an entering PhD cohort of 18.
- **Graduate Research Assistantship**, Division of Biostatistics and Health Data Science, University of Minnesota (2025–2026). Full tuition benefit and monthly stipend, three consecutive semesters.
- Received over ten undergraduate academic awards and scholarships (2017–2022).

Skills

Python, **R**, SQL, LaTeX, STATA, MatLab, Machine Learning, Deep Learning, Causal Inference, Simulation Modeling, Signal Processing