

YIJIANG PANG

pangyiji@msu.edu · +1 (517) 974-1173 · yijiangpang.github.io · Google Scholar

EDUCATION

Michigan State University

Doctor of Philosophy in Computer Science (In Progress). Advisor: Prof. Jiayu Zhou

2021/09 – expected 2027/05

Kent State University

Master of Technology in Technology (Completed). Advisor: Prof. Rui Liu

2019/09 – 2021/05

University of Electronic Science and Technology of China

Bachelor of Engineering in Mechanical Design Manufacture and Automation (Completed)

2009/09 – 2013/07

RESEARCH EXPERIENCE

Visiting Research Student

University of Michigan, ILLIDAN Lab

2024/09 – Present

(1). Cross-cohort biomarker modeling. Led two first-author clinical AI studies developing a surrogate-biomarker framework that links conversational language features with multimodal biomarkers across cohorts. Built the modeling pipeline, including harmonization of structured clinical variables, model training, and hyperparameter optimization; quantified predictive uncertainty using quantile regression and bootstrap methods.

(2). Efficient sequence modeling. Developing Fourier-based causal sequence-modeling blocks for long-context and irregularly timed data, investigating computationally efficient alternatives to self-attention for capturing multiscale temporal dependencies. Benchmarking the architectures on synthetic sequences and electronic health record next-event prediction.

Graduate Research Assistant

Michigan State University, ILLIDAN Lab

2021/09 – Present

(1). Adam theory. A first-author study establishing convergence guarantees for plain Adam under heavy-tailed stochastic noise through discounted-regret analysis and a generalized discounted-to-nonconvex conversion.

(2). Zeroth-order optimization. Proposed forward-pass-only optimization methods for deep models, proved optimal query-complexity bounds, and demonstrated performance improvements across vision and language tasks.

(3). Longitudinal clinical prediction. Led a first-author study predicting progression to mild cognitive impairment and Alzheimer's disease. Developed the complete modeling pipeline, from raw-data preprocessing and cohort construction to feature selection, model development, and evaluation.

(4). Research mentorship and technical leadership. Mentored an undergraduate researcher across three projects on subject harmonization, distributed batch-effect correction, and bilingual speech-based cognitive assessment, providing technical guidance that contributed to publications at PSB, KDD, and Interspeech.

RESEARCH FOCUS

Optimization for Machine Learning, Clinical AI, Sequential Data Modeling

PUBLICATIONS & MANUSCRIPTS

Optimization for Machine Learning

- [1] **The Convergence Behavior of Adam under Heavy-Tailed Noise** UAI 2026
Yijiang Pang
Proceedings of the 42nd Conference on Uncertainty in Artificial Intelligence [Proceedings] [arXiv]
- [2] **Closing the Bias-Correction Gap in Discounted Regret Analysis of Adam** IN SUBMISSION
Yijiang Pang, Jiayu Zhou [Paper]
- [3] **Towards Stability of Parameter-free Optimization** SDM 2026 (TO APPEAR)
Yijiang Pang, Shuyang Yu, Bao Hoang, Jiayu Zhou
SIAM International Conference on Data Mining [arXiv] [Code]
- [4] **Stochastic Two Points Method for Deep Model Zeroth-order Optimization** ARXIV 2024
Yijiang Pang, Jiayu Zhou [arXiv] [Code]

- [5] **Cross-Cohort Surrogate Modeling Links Conversational Language Features to Multimodal Biomarkers** AMIA 2026
Yijiang Pang, Alexander Hart, Hiroko Dodge, Jiayu Zhou
American Medical Informatics Association Annual Symposium [Paper]
- [6] **Conversational Semantic Dynamics for Mild Cognitive Impairment Detection** AMIA 2026
Jiachen Lyu, Haohao Zhu, Yijiang Pang, Hiroko Dodge, Jiayu Zhou
American Medical Informatics Association Annual Symposium [Paper]
- [7] **Feasibility of identifying factors related to Alzheimer’s disease and related dementia in real-world data** JAMIA OPEN
Yu Huang, Qian Li, Aokun Chen, Yongqiu Li, Yu-Neng Chuang, Xia Hu, Serena Jingchuan Guo, Xing He, Yijiang Pang, Jiayu Zhou, Yonghui Wu, Yi Guo, Jiang Bian
JAMIA Open, Volume 9, Issue 2, April 2026, ooag060 [Journal]
- [8] **Bridging Language Markers and Pathology: Correlations Between Digital Speech Measures and Surrogate CSF Biomarkers in Alzheimer’s Disease** AD: DADM 2026
Yijiang Pang, Liu Chen, Hiroko Dodge, Jiayu Zhou
Alzheimer’s & Dementia: Diagnosis, Assessment & Disease Monitoring [Journal]
- [9] **Subject Harmonization of Digital Biomarkers: Improved Detection of Mild Cognitive Impairment from Language Markers** PSB 2024
Bao Hoang, Yijiang Pang, Hiroko Dodge, Jiayu Zhou
Pacific Symposium on Biocomputing. Vol. 29. 2024 [Paper] [Code]
- [10] **Distributed Harmonization: Federated Clustered Batch Effect Adjustment and Generalization** KDD ADS 2024
Bao Hoang, Yijiang Pang, Siqu Liang, Liang Zhan, Paul M. Thompson, Jiayu Zhou
KDD Applied Data Science Track [Paper] [Code]
- [11] **Translingual Language Markers for Cognitive Assessment from Spontaneous Speech** INTERSPEECH 2024
Bao Hoang, Yijiang Pang, Hiroko Dodge, Jiayu Zhou
25th Interspeech Conference [Paper] [Code]
- [12] **Predicting Progression from Normal to MCI and from MCI to AD Using Clinical Variables in the National Alzheimer’s Coordinating Center Uniform Data Set Version 3: Application of Machine Learning Models and a Probability Calculator** JPAD 2023
Yijiang Pang, Walter Kukull, Mary Sano, Roger L. Albin, Changyu Shen, Jiayu Zhou, Hiroko Dodge
The journal of prevention of Alzheimer’s disease 10.2 (2023): 301-313 [Journal]

Broader Machine Learning Applications

- [13] **ChatWise: A Strategy-Guided Chatbot for Enhancing Cognitive Support in Older Adults** KDD 2025 WORKSHOP
Zhengbang Yang, Junyuan Hong, Yijiang Pang, Jiayu Zhou, Zhuangdi Zhu
Workshop on Large Language Models for Scientific and Societal Advances at KDD 2025 [OpenReview]
- [14] **Cross-modality debiasing: using language to mitigate sub-population shifts in imaging** ARXIV 2024
Yijiang Pang, Bao Hoang, Jiayu Zhou
arXiv:2403.07888 [arXiv]
- [15] **RUSH: Robust contrastive learning via randomized smoothing** ICML 2022 WORKSHOP
Yijiang Pang, Boyang Liu, Jiayu Zhou
Workshop on New Frontiers in Adversarial Machine Learning at ICML 2022 [Paper]

TALKS AND POSTER PRESENTATIONS

- Cross-Cohort Surrogate Modeling Links Conversational Language Features to Multimodal Biomarkers** 2026/11
Oral presentation (scheduled), American Medical Informatics Association Annual Symposium (AMIA 2026)
- Towards Reliability of Parameter-Free Optimization** 2026/11
Oral presentation (scheduled), SIAM International Conference on Data Mining (SDM 2026)
- The Convergence Behavior of Adam under Heavy-Tailed Noise** 2026/08
Virtual poster presentation, 42nd Conference on Uncertainty in Artificial Intelligence (UAI 2026) [Poster]
- Stochastic Two Points Method for Deep Model Zeroth-order Optimization** 2024/10
Poster presentation, 2024 Michigan AI Symposium, Michigan AI Lab

AWARDS & HONORS

NeurIPS 2026 Top Reviewer Distinction NeurIPS Conference Top 8% of reviewers	2026/10
Graduate School Travel Fellowship Fellowship Michigan State University Travel support for SDM 2026	2026/10 \$748
Graduate School Travel Fellowship Fellowship Michigan State University Travel support for AMIA 2026	2026/09 \$1,652
NSF-supported Partial Travel Award Award SDM Doctoral Student Forum	2026/09
UAI 2026 Registration Scholarship Scholarship UAI Conference	2026/07
Partial Summer Fellowship Fellowship College of Engineering, Michigan State University	2024/04 \$4000
Partial Summer Fellowship Fellowship College of Engineering, Michigan State University	2023/04 \$3,800

PROFESSIONAL SERVICE

Conference Reviewer	NeurIPS 2025, 2026 (Top Reviewer) ICLR 2025, 2026; UAI 2026; AAAI 2026, 2027
Journal Reviewer:	Journal of Machine Learning Research (JMLR) 2026 IEEE Journal of Biomedical and Health Informatics ACM Transactions on Computing for Healthcare

TECHNICAL SKILLS

Optimization & Learning Theory	Stochastic and nonconvex optimization; adaptive gradient and zeroth-order methods; online learning; convergence and regret analysis; optimizer design, implementation, and analysis
LLM training and inference	Neural-network implementation, training, and parameter-efficient fine-tuning; Transformer and sequence models, e.g., linear attention, flash attention
Data & Experimental Methods	Data preprocessing, cohort construction, harmonization, and feature engineering; reproducible experimentation, hyperparameter optimization, feature-importance and sensitivity analyses, and uncertainty quantification
Scientific Computing	scikit-learn, LightGBM, XGBoost, CatBoost, Optuna, NumPy, pandas, and SciPy
Programming & Development Tools	Python and C; Linux, Git, Docker, Jupyter, and LaTeX
Electrical Engineering fundamentals	Computer architecture and embedded-hardware fundamentals; power electronics, PCB design, and circuit debugging and testing

PROFESSIONAL EXPERIENCE

Electronics Engineer <i>Superxon, China</i> Designed, debugged, and tested optical-module circuitry	2016 – 2019
Electronics Engineer <i>TCL air conditioner, China</i> Designed printed circuit board (PCB) layouts, high-voltage power supply circuits, and low-voltage control circuits	2013 – 2016