XINXING WU, PH.D.

♪ **HomePgae** — https://xinxingwu.github.io
♩ **GitHub** — https://github.com/xinxingwu-uk
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OVERVIEW

★ Applied Researcher in AI & Data ★ Real-World Problem Solver ★ Innovation Through Insight

- **Proven experience** applying machine learning, statistical modeling, and data analysis in real-world, project-driven environments
- **Advanced programming skills** in Python, with a strong focus on building scalable, efficient solutions
- **First-author research** in top-tier AI conferences, including **NeurIPS**, **AAAI**, and **IJCAI** - demonstrating both technical depth and innovation
- **Quick to adapt and master new technologies**, with a strong track record of translating concepts into practical applications
- **Excellent** communicator and proactive team player, known for contributing to high-impact, collaborative projects

More details can be found on HomePage Link

TECHNIQUES/SKILLS

- **Proficient** in developing algorithms and building models with Python, including GPU-based model training experience using resources such as the Texas Advanced Computing Center
- **6$^+$ years** of experience applying algorithms and machine learning models in project-based settings across both industry and academic research
- **Hands-on experience** analyzing diverse data types, including numerical, text, genetic, image, and longitudinal datasets
- **Working knowledge** of Python (Keras, TensorFlow, scikit-learn, Pandas, NumPy, OpenCV), R, SQL, Java SE, C#, PHP, with hands-on experience using development tools such as JupyterLab, PyCharm, Visual Studio, Eclipse, and Linux environments.

- **Feature selection studies** for identifying key features/biomarkers from 2d-*image*/large genetic data, and video corner detection (Shi-Tomasi algorithm) & tracking (Lucas–Kanade method)
- **Machine Learning/Statistics**: Feature selection algorithms, deep learning models, graph neural networks, survival analysis, and statistical computing
- **Data Analysis**: Applying machine learning and statistical methods to real-world data analysis
- **Large language model** projects and application experience

WORK EXPERIENCE

Midway University, Kentucky, United States, 2023 - Present
Assistant Professor (*Research* - Application of machine learning algorithms and data analysis; *In-seat and Online Teaching*; Also, as a computer science major advisor)

External Experts Program at Amazon Mechanical Turk (Part-time), 2025 - Present
Expert (AI Evaluation-Focused Mathematical Problem Designer). Design and analyze advanced mathematical problems to assess and challenge state-of-the-art AI models. Specialize in real analysis, measure theory, probability, and functional analysis. Evaluate AI-generated solutions for rigor and consistency, identify flaws, and provide detailed corrective feedback to improve model reasoning and performance.

Shanghai Threebio Technology Co., Ltd. (Part-time), Shanghai, China, 2016 - 2018
Principal Investigator (Statistical computing of user purchase demand and customer behavior analysis)

Shanghai Technical Institute of Electronics and Information, Shanghai, China, 2013 - 2018
Associate Professor (Teaching and research project - data structure and algorithm analysis, *Java SE*, *PHP*, programming on Arduino - with *Python* and *Java SE*)

Shanghai Advanced Research Institute of CAS, Shanghai, China, 2012 - 2013
Senior Algorithm Engineer (Algorithm development, programming on Tilera - with *Python*)

Shanghai Alcatel Network Support Systems Co., Ltd., Shanghai, China, 2011 - 2012
Algorithm Developer (Algorithm development - with *Java SE* development and *SQL* data analysis)

RECENT PROJECT EXPERIENCE

Project - **Feature Selection Algorithm** 2019 - 2021
The project introduces the top-k regularization method to improve existing feature selection algorithms in high-dimensional datasets, enhancing model performance by balancing feature representativeness and correlation. Applicable across various learning models, this method is supported by strong theoretical analysis and extensive empirical validation, showing superior performance in both regression and classification tasks. The work advances feature selection techniques, leading to more accurate and interpretable models in diverse real-world applications like gene expression analysis and image recognition.

Project - **Deep Graph Neural Network for Link Prediction** 2021 - 2022
The project introduces a Deepened Graph Auto-Encoder (DGAE) to overcome the limitations of shallow graph auto-encoders in link prediction for non-Euclidean data. By integrating standard auto-encoders and leveraging multi-scale information through residual connections, DGAE captures complex node and edge relationships more effectively. The approach consistently outperforms traditional shallow models, demonstrating empirical and theoretical advantages in enhancing link prediction accuracy.

Project - **Untimed Gene Data Circadian Exploration** 2020 - 2021
The project focuses on uncovering the link between circadian rhythms and Alzheimer's Disease (AD). Proposing a novel algorithm, PRIME. This approach detects circadian oscillation patterns in untimed gene expression data across multiple brain regions. The research reveals that synchronized circadian rhythms in healthy controls are significantly disrupted in AD patients, indicating early signs of the disease. By integrating advanced computational techniques and validating across species and organs, the project offers valuable insights into the potential for diagnostic and therapeutic strategies targeting circadian disruptions in AD.

Project - **Clinical Data Survival Analysis** 2021 - 2023
The project focuses on using advanced deep learning algorithms to predict stage-specific time to conversion in individuals with AD and LATE. By applying the DeepSurv model to a large cohort dataset, the project accurately estimates disease progression probabilities, addressing the heterogeneity of AD and LATE. This approach provides valuable insights into critical predictors, contributing to personalized therapeutic strategies and early interventions in neurodegenerative diseases.

More work can be found on GitHub Link

CERTIFICATIONS

- Red Hat Certified Engineer
- Red Hat Certified System Administrator

SOFTWARE COPYRIGHTS

[1] **Xinxing Wu**, Junyan Li. The visualization measurement tool of Software reliability v2.0 (2014SR117616, Java SE), software copyright, 2014, 8 (In Chinese)

[2] Junyan Li, Hao Lu, **Xinxing Wu**, Feng Tao. The visualization calculation tool of sample data v1.0 (2014SR079068, Java SE), software copyright, 2014, 6 (In Chinese)

EDUCATION AND TRAINING

University of Kentucky, Kentucky, United States, 2019 - 2022
Postdoctoral Scholar (**Machine learning** - developing algorithms and models; **Data analysis** - applying developed algorithms and models to analyze practical data, including numerical, clinical, genetic, 2D-image, and longitudinal data, with Python; **Video-based infrastructure damage analysis**)

Boston University, Massachusetts, United States, 2018 - 2019
Visiting Researcher (Machine learning and data analysis - with *R* and *Python*)

Fudan University, Shanghai, China, 2015 - 2016
Visiting Scholar (Statistical learning theory)

East China Normal University, China, Ph.D. 2007 - 2011
Computer Applications Technology

Anhui Normal University, China, M.S. 2004 - 2007
Mathematics (Probability Theory)

Huzhou University, China, B.S. 2000 - 2004
Mathematics and Applied Mathematics

SELECTED PUBLICATIONS

[1] **Xinxing Wu**, Junping Zhang, Wang Fei-Yue. Stability-based Generalization Analysis of Distributed Learning Algorithms for Big Data. *IEEE Transactions on Neural Networks and Learning Systems*, 2020, 31 (3), 801-812. Paper link

[2] **Xinxing Wu**, Qiang Cheng. Fractal Autoencoders for Feature Selection. *The 35th AAAI Conference on Artificial Intelligence (AAAI 2021)*. 2021. Paper link Paper codes

[3] **Xinxing Wu**, Qiang Cheng. Algorithmic Stability and Generalization of An Unsupervised Feature Selection Algorithm. *The 35th Conference on Neural Information Processing Systems (NeurIPS 2021)*. 2021. Paper link Paper codes

[4] **Xinxing Wu**, Chong Peng, Peter T. Nelson, et al. Random Forest-Integrated Analysis in AD and LATE Brain Transcriptome-Wide Data to Identify Disease-Specific Gene Expression. *PLOS One*, 2021, 16 (9), e0256648. Paper link Paper codes

[5] **Xinxing Wu**, Qiang Cheng. Deepened Graph Auto-Encoders Help Stabilize an Enhance Link Prediction. *The 31st International Joint Conference on Artificial Intelligence and the 25th Europe an Conference on Artificial Intelligence (IJCAI 2022)*. 2022. Paper link Paper codes

[6] **Xinxing Wu**, Chong Peng, Peter T. Nelson, et al. Machine Learning Approach Predicts Probability of Time to Stage-Specific Conversion of Alzheimer's Disease. *Journal of Alzheimer's Disease*, 2022, 90 (2), 1-13. Paper link Paper codes

More work can be found on Google Scholar Link