XINXING WU, PH.D.

♩**GitHub** — https://github.com/xinxingwu-uk

✆ **Phone**: 617-259-6772,   ✉ **E-mail**: xinxingwu@gmail.com

OVERVIEW

- *Years of project-based experience* in machine learning algorithm design and data analysis
- *Extensive practice* in programming
- *Solid* academic research (First author at **NeurIPS**, **AAAI**, **IJCAI**, . . .)
- Good learning ability, communication skills, and team spirit

I work on machine learning, statistical modeling, and data analysis, by Python and sometimes R

TECHNIQUES/SKILLS

- **Proficiency** in developing algorithms and building models with *Python*, including model training experience on GPU (Texas Supercomputing Center)
- **5+Years** of project-based computational applications of algorithms and models
- **Practical experience** in analyzing various data types, including *numerical*, *text*, *genetic*, *image*, and *longitudinal* data
- **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), such as ↳Link1; ↳Link2; ↳Link3; ↳Link4; ↳Link5
- **Large language model** projects and application experience
- **Working knowledge of** *Python (Keras, scikit-learn, Tensorflow, Pandas, Numpy, OpenCV, . . .)* , *R*, *SQL* (Database), *Java SE, C# , PHP,* JupyterLab, PyCharm, Visual Studio, Eclipse, Linux, . . .
- **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

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* - developing a diverse array of computer science courses spanning introductory to advanced levels. Also, as a computer science major advisor, providing guidance and mentorship to support students' academic and professional growth)

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

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* and *SQL*)

EDUCATION AND TRAINING

University of Kentucky, Kentucky, United States,   2019 - 2022
Postdoctoral Scholar (Machine learning - developing algorithms and building 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

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)

PROJECT EXPERIENCE

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.

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.

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.

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.

Other Projects of AI practices

· **Image data** - Static image speak: ↩**Link**
· **Audio data** - Clone your voice: ↩**Link**
· **Video data** - Swap your face: ↩**Link**
· Play Sudoku with Deep Learning: ↩**Link**

Some representative work can be found on GitHub https://github.com/xinxingwu-uk

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**, 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

[5] **Xinxing Wu**, Chong Peng, Donna M. Wilcock, et al. PRIME Uncovers Circadian Oscillation Patterns and Links with Alzheimer's Disease in Untimed Genome-Wide Gene Expression Data across Multiple Regions of Human Brain. *Alzheimer's & Dementia: The Journal of the Alzheimer's Association*, 2021, 17 (S5), e053266. ↩Paper link

[6] **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

[7] **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

[8] **Xinxing Wu**, Peter T. Nelson, Qiang Cheng. Positive effect of moderate alcohol intake for AD. *Alzheimer's & Dementia: The Journal of the Alzheimer's Association*, 2023, 19, e063758. ↩Paper link

More work can be found on Google Scholar Link

TOP CONFERENCE SEMINARS

· AAAI-2021 ↝Seminar link	Febuary 4, 2021
· NeurIPS-2021 ↝Seminar link	December 6, 2021
· IJCAI-2022 ↝Seminar link	July 23, 2022

ACADEMIC ACTIVITIES

· **Program Committee Member of International Conferences:** NeurIPS, ICML, AAAI, CVPR, IJCAI, ICLR, ICCV, ECCV, WWW, AMIA, FSDM, MLIS, CAIT . . .

· **Journal Reviewer:** TMLR, CAAI Transactions on Intelligence Technology, Artificial Intelligence in Medicine, Heliyon, International Neuropsychiatric Disease Journal, Journal of Advances in Biology & Biotechnology, Advances in Research, . . .

· **Technical Chair** of the International Conference on Big Data Science and Management Engineering (BDSME 2023)

· **Principle investigator** of the **Shanghai Talent Development Fund** (Grant No. 201629), 2016