YULE WANG

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EDUCATION

Georgia Institute of Technology, Atlanta, GA, USA.　　　　　　　　　　Aug. 2022 – Present
Doctor of Philosophy - Machine Learning

- **Ph.D. Advisor**: Prof. Anqi Wu.
- **Department**: School of Computational Science and Engineering (CSE).
- **Research Interests**: (Multi-Modal) Diffusion Models; Time-Series Analysis; Computational Neuroscience.

Shanghai Jiao Tong University, Shanghai, China.　　　　　　　　　　Sep. 2019 – Mar. 2022
Master of Engineering - Computer Science and Engineering

- **Research Topics**: Machine Learning; Recommender Systems.

Shanghai Jiao Tong University, Shanghai, China.　　　　　　　　　　Sep. 2015 – Jun. 2019
Bachelor of Engineering - Software Engineering

- **Research Topics**: Deep Learning; Recommender Systems.

INDUSTRY EXPERIENCE

Research Scientist Intern at Meta　　　　　　　　May. 2025 – Aug. 2025. New York City, U.S.

Org: Reality Labs, Intern Manager: Luke Boegner

Topic: Diffusion Models, Neural Biosignal Time-Series Analysis

- Leveraged DiT-based diffusion models to synthesize sEMG time-series data and developed complementary data augmentation methods, boosting the classification accuracy on imbalanced categories by 8.42% on downstream neural decoding tasks.

Recommender Systems Research Intern at Alibaba　　　　　　Jun. 2021 – Sep. 2021. Beijing, China.

Intern Manager: Dr. Hongbo Deng

Topic: User Multi-Interest Modeling in E-commerce

- Enhanced the Click-Through Rate (CTR) prediction performance for Tmall's advertising system by incorporating task position features into the Multi-Interest Network with Dynamic Routing (MIND) model and implementing a gradient exploration strategy in the recall stage. This approach was successfully deployed in the online advertising system, achieving a 1.4% AUC gain in CTR prediction.

Machine Learning Research Intern at TikTok　　　　　　Sep. 2020 – Feb. 2021. Shanghai, China.

Topic: Semantic Role Labeling

- Enhanced the Q&A service by implementing Semantic Role Labeling (SRL) of user queries using ELECTRA, turning to a 2.71% increase in user satisfaction rate. Improved the performance of TikTok's smart dialog system by optimizing question recognition and classification accuracy at the main search entry using ALBERT, achieving a 0.56% increase in recall.

SELECTED RESEARCH PROJECTS

Extraction and Recovery of Spatio-Temporal Structure in Latent Dynamics Alignment with Diffusion Models　　　　[NeurIPS'23 Spotlight]　　First Author

- The stability of brain-computer interfaces (BCIs) across sessions is a critical concern. While raw neural recordings typically exhibit high variability and low signal-to-noise ratios, the spatio-temporal structure of latent neural trajectories exhibits robustness across sessions. In light of this, we propose ERDiff, a domain adaptation method that leverages the expressive power of diffusion models to capture the spatio-temporal structure of latent trajectories in the source domain (BCI's training session). During the alignment phase, guided by the well-trained diffusion model, ERDiff employs a maximum likelihood alignment (MLA) approach to precisely recover these structures in the target domain (BCI's incoming session).

ICPE: An Item Cluster-wise Pareto-efficient Framework for Recommendation Debiasing　　　　[TKDE'24 Submission]　　First Author

- The data corpus used to train the recommender model normally suffers from severe bias issues (e.g., exposure bias, popularity bias). In this work, we explore recommendation debiasing from an item cluster-wise multi-objective optimization perspective. We observed that the gradients coming from head items dominate the overall gradient update process. To address this, we propose a model-agnostic framework, ICPE, which uses item cluster-wise Pareto-efficiency. Specifically, we first characterize item popularity levels through causal reasoning. Next, we employ popularity discrepancy-based bisecting clustering to partition the item clusters, and derive an overall fair gradient direction from a Pareto-efficient solver. Extensive experiments on three public datasets verify the effectiveness of ICPE in both improving recommendation accuracy and mitigating bias.

Exploring Behavior-Relevant and Disentangled Neural Dynamics with Video Diffusion Models   [NeurIPS'24 Poster]   First Author

- Understanding the neural basis of animal behavior is a fundamental goal in neuroscience. Our proposed method, BeNeDiff, first identifies a disentangled neural subspace through a total-correlation-aware variational autoencoder (VAE). Next, we leverage conditional video diffusion models (VDMs) to synthesize behavioral videos that correspond to the activation within the neural trajectory of a specific latent factor. Notablly, we design a biologically-informed InfoNCE objective to guide the score update at each diffusion generation step. These synthesized video results provide scientific insights by illustrating that the neural dynamics of the latent factors exhibit specificity to the corresponding behaviors of interest.

SELECTED PUBLICATIONS AND PREPRINTS

(The full publication list can be found in this link):

Core Machine Learning and Time-Series Analysis:

- **Yule Wang**, Joseph Yu, Chengrui Li, Weihan Li, Anqi Wu. "Uncovering Semantic Selectivity of Latent Groups in Higher Visual Cortex with Mutual Information-Guided Diffusion". *Arxiv Preprint, 2025.*

- Weihan Li, **Yule Wang**, Chengrui Li, Anqi Wu. "Learning Time-Varying Multi-Region Communications via Scalable Markovian Gaussian Processes". In *International Conference on Machine Learning (ICML), 2025. [Oral]*

- **Yule Wang**, Chengrui Li, Weihan Li, Anqi Wu. "Exploring Behavior-Relevant and Disentangled Neural Dynamics with Video Diffusion Models". In *Neural Information Processing Systems (NeurIPS), 2024.*

- Chengrui Li, **Yule Wang**, Weihan Li, Anqi Wu. "Forward χ^2 Divergence Based Variational Importance Sampling". In *International Conference on Learning Representations (ICLR), 2024. [Spotlight]*

- **Yule Wang**, Zijing Wu, Chengrui Li, Anqi Wu. "Extraction and Recovery of Spatio-Temporal Structure in Latent Dynamics Alignment with Diffusion Models". *Neural Information Processing Systems (NeurIPS), 2023. [Spotlight]*

- Weihan Li, Chengrui Li, **Yule Wang**, Anqi Wu. "Multi-Region Markovian Gaussian Process: An Efficient Method to Discover Directional Communications Across Multiple Brain Regions". *International Conference on Machine Learning (ICML), 2024.*

Recommender Systems:

- **Yule Wang**, Xin Xin, Yue Ding, Dong Wang. "ICPE: An Item Cluster-Wise Pareto-Efficient Framework for Recommendation Debiasing". In *Transactions on Knowledge and Data Engineering (TKDE), 2024.*

- **Yule Wang**, Qiang Luo, Yue Ding, Dong Wang, Hongbo Deng. "DemiNet: Dependency-Aware Multi-Interest Network with Self-Supervised Graph Learning for Click-Through Rate Prediction". *Arxiv Preprint, 2022.*

- Yunzhe Li, Bo Chen, Xin Xin, **Yule Wang**, Yuxiang Shi, Ruiming Tang, Dong Wang. "Extracting Attentive Social Temporal Excitation for Sequential Recommendation". In *ACM International Conference on Information and Knowledge Management (CIKM), 2021.*

- Bo Chen, Yue Ding, Xin Xin, **Yule Wang**, Dong Wang. "AIRec: Attentive intersection model for tag-aware recommendation". In *Neurocomputing, 2021.*

SOFTWARE DEVELOPMENT PROJECT

SOPTOP: WiFi-Streaming Intelligent Classroom System   Feb. 2019 – Sep. 2019. Shanghai, China.

- Develop a commercial multi-media streaming system for smart teaching using FFmpeg and Kubernetes. Enable mutual transmission of 1080P, 25FPS live streams between the server and student clients with a delay of less than 200ms. Successfully launch the system on Android and iOS app markets.

TECHNICAL SKILLS

Programming Languages: C++, Python, Java, Matlab, Latex
Deep Learning Frameworks: Pytorch (Lightning), Tensorflow

TEACHING AND ACADEMIC SERVICES

Teaching Experience:

- Head TA for GaTech CSE 8803: Machine Learning for Neural/Behavioral Data. Fall 2025
- TA for GaTech ECE 6254: Statistical Machine Learning. Spring 2024

Conference Program Committee: AAAI 2024/25.
Conference Reviewer: NeurIPS 2023/24/25; ICML 2023/24/25; ICLR 2024/25/26; AISTATS 2024/25; COSYNE 2026.