

Bohan WANG

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Research Interests: Graph machine learning; Diffusion/score-based generative models; OOD generalization; Graph generation; Time series analysis.

EDUCATION BACKGROUND & SCHOLARSHIPS

Emory University PhD in Computer Science advised by Prof. Wei Jin.	01/2025 - Current
École Polytechnique Fédérale de Lausanne (EPFL) Master of Science (MSc) in Electrical and Electronic Engineering with a Minor in Data Science; GPA: 5.38/6.0	09/2020 - 10/2023
University of Nottingham, Nottingham United Kingdom (UoN) First-class BEng. (Hons) in Electrical and Electronic Engineering; GPA: 85.0/100 (Ranked Top 10% in Department of Electrical and Electronic Engineering) - Honor: Nottingham Engineering Excellence Scheme (2018-2019, Top 5% in Department) - Scholarship: Awarded Dean's Scholarship for Academic Excellence (2017-2018, Top 10% in Department)	09/2016 - 07/2020

PUBLICATIONS(*indicates equal contribution)

Conference Papers

- Exposing Vulnerabilities in Explanation for Time Series Classifiers via Dual-Target Attacks**
Bohan Wang, Zewen Liu, Lu Lin, Hui Liu, Li Xiong, Ming Jin, Wei Jin
arXiv
Paper link: <https://www.arxiv.org/abs/2602.02763>
- Graph odes and beyond: A comprehensive survey on integrating differential equations with graph neural networks**
Zewen Liu*, Xiaoda Wang*, **Bohan Wang**, Zijie Huang, Carl Yang, and Wei Jin.
Proceedings of the 31th ACM SIGKDD Conference on Knowledge Discovery and Data Mining, 2025
Paper link: <https://arxiv.org/abs/2503.23167>
- Mitigating Graph Covariate Shift via Score-Based Out-of-Distribution Augmentation**
Bohan Wang, Yurui Chang, Wei Jin, Lu Lin.
arXiv
Paper link: <https://www.arxiv.org/abs/2410.17506>
- DiGress: Discrete Denoising diffusion for graph generation**
Clément Vignac*, Igor Krawczuk*, Antoine Siraudin, **Bohan Wang**, Volkan Cevher, Pascal Frossard.
The International Conference on Learning Representations (ICLR), 2023
Paper link: <https://arxiv.org/abs/2209.14734>
- Regularization of polynomial networks for image recognition**
Grigorios G Chrysos, **Bohan Wang**, Jiankang Deng, Volkan Cevher.
The IEEE / CVF Computer Vision and Pattern Recognition Conference (CVPR), 2023
Paper link: <https://arxiv.org/abs/2303.13896>
- ALO-VC: Any-to-any Low-latency One-shot Voice Conversion**
Bohan Wang, Damien Ronssin, Milos Cernak.
INTERSPEECH Conference, 2023
Paper link: <https://arxiv.org/abs/2306.01100>
- Detection of Typical Sentence Errors in Speech Recognition Output**
Bohan Wang*, Ke Wang*, Siran Li*, Mark Cieliebak.
Junior track, The 7th Swiss Text Analytics Conference (SwissText)
Paper link: <https://ceur-ws.org/Vol-3361/paper1.pdf>

RESEARCH & INTERNSHIP EXPERIENCES

Research Assistant, The Pennsylvania State University (Supervisor: Prof. Lu Lin)	01/2024 - 10/2024
- Proposed CODA, a conditional score-based diffusion method for graph covariate shift with controllable OOD augmentation. - Developed a unified generator for structure + node/edge features, handling graph feature/structural/joint covariate shifts. - Submitted a paper to the KDD 2026 conference as the first author.	
Engineering Internship focusing on deep learning, Logitech (Supervisor: Dr. Milos Cernak)	09/2022 - 03/2023
- Designed and implemented a Conformer based deep learning model to capture Phonetic posteriorgrams (PPGs) from a speech. - Designed and implemented a deep learning model to generate a sequence of converted acoustic features for LPCNet to synthesize target speaker speech with the same linguistic content as the source speech.	

- Designed and implemented a non-parallel low-latency real-time any-to-any voice conversion system.
- **First-authored a paper accepted by the INTERSPEECH Conference 2023.**

Research Assistant, Signal Processing Laboratory (LTS4), EPFL

07/2022 - 09/2022

(Supervisors: Clément Vignac and Prof. Pascal Frossard)

- Visualized the diffusion process and denoising process of a discrete diffusion model for graph generation.
- Trained a graph transformer network to predict target properties of a clean graph from its noisy version.
- Designed and implemented the conditional denoising process for the discrete denoising diffusion model.
- Implemented molecular scaffold extension using the discrete denoising diffusion model to extend existing subgraphs.
- **Co-authored a paper accepted by the International Conference on Learning Representations (ICLR) 2023.**

Research Assistant, Department of Electrical and Electronic Engineering, UoN

06/2019 - 09/2019

(Supervisor: Prof. Phil Sewell)

- Designed and deployed a C++/Qt GUI to automate the extraction, 2D visualization, and reporting (CSV to TXT) of large-scale experimental data.
- Enhanced software performance and user experience by debugging code and integrating interactive UI features (e.g., drag-and-drop, dynamic resizing).
- Integrated the interface with existing experimental software to achieve real-time data monitoring, recording, and exporting.

PROJECT EXPERIENCES

Master Thesis Project, Graph Based Sketch Generation and Globally Accurate Graph Generation Metrics, ETH Zürich

03/2023 - 09/2023

(Supervisors: Karolis Martinkus, Dr. Nathanaël Perraudin, Prof. Pascal Frossard and Prof. Roger Wattenhofer)

- Designed and implemented three diffusion models for sketch graph generation: ConSketchGrapher, MixSketchGrapher, and SpectraSketchGrapher.
- Evaluated three distinct types of graph representations for sketches: multi-line graphs, multi-line graphs with intersection points, and smoothed B-Spline multi-line graphs.
- Explored and compared various evaluation metrics for graph generation. Proposed a spectral-based evaluation metric for graph generation, and subsequently evaluated this newly proposed spectral-based evaluation metric for graph generation.

Group Project, Complete Sentence Detection for Speech Recognition Systems, EPFL

09/2021 - 01/2022

(Supervisor: Prof. Mark Cieliebak)

- Selected four diverse datasets: News reports, Ted 2020 Parallel Sentences Corpus, Wikipedia corpus, and Topical-Chat.
- Preprocessed data using sentence tokenization, removed sentence-ending symbols, short sentences, and duplicates.
- Created negative samples simulating speech recognition system errors, including false boundaries and missing/repeated words.
- Fine-tuned BERT, GPT-2 and BIG-BIRD transformer models to extract sentence embeddings for downstream classification.
- Conducted ensemble learning using random forest for predictions from different transformer models.
- **Co-first authored a paper accepted by the 7th Swiss Text Analytics Conference.**

Master Semester Projects, Regularization of Polynomial Neural Networks, EPFL

02/2021 - 01/2022

(Supervisors: Dr. Grigorios Chrysos and Prof. Volkan Cevher)

- Proposed a recursive equation for regularized polynomial expansion.
- Designed regularized Deep Polynomial Networks (DPNs) in PyTorch based on the proposed parameterization.
- Designed stabilization techniques (normalization, initialization, and explicit regularization) to mitigate training instability.
- Conducted large-scale experiments on CIFAR, STL, Tiny ImageNet, and ImageNet to evaluate robustness and generalization of regularized DPNs.
- Achieved comparable performance to ResNet18 using regularized DPNs (without activation functions).
- Implemented self-supervised models (MoCo, SimCLR) and evaluated DPNs-based encoders.
- Designed a new DPN variant with dense connections across polynomials for a higher degree of polynomial expansion.
- Developed a specific regularization scheme to address instability issues in the new DPN variant.
- Demonstrated that the new DPN variant (without activation functions) containing only 7 million trainable parameters matched ResNet18.
- **Co-authored a paper accepted by the IEEE / CVF Computer Vision and Pattern Recognition Conference (CVPR) 2023.**

QUALIFICATION & SKILLS

Languages: Chinese Mandarin (Native) and English (Proficient);

Deep Learning Libraries: PyTorch, PyG (PyTorch Geometric), DGL, NetworkX, TensorFlow, Gensim, OpenCV, etc

Programming Languages: C, C++, Python, Java