# Faye Nie

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## Education

**Stanford University** Sep 2024 – May 2026 (Expected)
Master in Electrical Engineering (AI Track) Palo Alto, USA
- CS221: Artificial Intelligence: Principles and Technique; CS224W: Machine Learning with Graphs

**Shanghai Jiao Tong University** Sep 2020 – Jun 2024
B.Eng in Computer Science and Technology (IEEE Honor Class) Shanghai, China
- GPA 92.79/100, Rank 2/122
- A+ Courses: Computer Architecture, Computer Networks, Artificial Intelligence, NLP and 19 others
- Awards: Excellent Graduate (Top 5%), Undergraduate Excellence Scholarship (Top 1%), Rong Chang Science and Technology Innovation Scholarship (1/10), Alumni Inheritance Fund (Top 3%), Outstanding Student Leader

**École Polytechnique Fédérale de Lausanne (EPFL)** Feb 2023 – Jul 2023
Exchange Student of Computer Science Lausanne, Switzerland
- Courses: Database System (6.0/6.0), Machine Learning (6.0/6.0), Data Visualization (6.0/6.0)

## Publication

(* means equal contribution)

1. Z. Li, **F. Nie**, Q. Sun, F. Da, H. Zhao. **Uncertainty-Aware Decision Transformer for Stochastic Driving Environments.** *arXiv preprint arXiv:2309.16397, 2023.* **(CoRL 2024 Oral)**.

2. Z. Li*, **F. Nie***, Q. Sun, F. Da, H. Zhao. **Boosting Offline Reinforcement Learning for Autonomous Driving with Hierarchical Latent Skills**. *arXiv preprint arXiv:2309.13614*. **(ICRA 2024 Oral)**.

3. Q. Wu, **F. Nie**, C. Yang, J. Yan. **Learning Divergence Feilds for Generalization with Data Geometries**. **(ICML 2024)**.

4. Q. Wu, **F. Nie**, C. Yang, T. Bao, J. Yan. **Graph Out-of-Distribution Generalization via Causal Intervention**. *The ACM Web Conference* **(WWW 2024 Oral)**.

5. Q. Wu, W. Zhao, C. Yang, H. Zhang, **F. Nie**, H. Jiang, Y. Bian, J. Yan. **Simplifying and Empowering Transformers for Large-graph Representations**. *In Advances in Neural Information Processing Systems* **(NeurIPS 2023)**.

6. Z. Li, Q. Wu, **F. Nie**, J. Yan. **Graphde: A Generative Framework for Debiased Learning and Out-of-distribution Detection on Graphs**. *In Advances in Neural Information Processing Systems* **(NeurIPS 2022)**.

## Research Experience

**Factuality Testing in LLMs** May 2024 – Present
Submitted to ICLR2025; the First Author Rutgers
- Proposed a distribution-free and finite-sample framework via hypothesis testing to statistically evaluate whether an LLM can confidently provide correct answers to given questions with high-probability correctness guarantees.

**Data Selection on Motion Prediction** July 2024 – Present
Submitted to ICLR2025; the Co-First Author VITA, EPFL
- Designed and implement data selection algorithms leveraging gradient-based data attribution scores on motion prediction datasets.
- Proposed the use of importance weights to emphasize the most significant selected data samples, leading to enhanced performance in downstream trajectory prediction.

**Uncertainty-Aware Decision Transformer** Mar 2023 – Nov 2023
Full paper accepted by CoRL'24; the Second Author MARSLab, THU
- Presented an uncertainty-aware decision transformer (DT) for a stochastic driving environment; estimated state uncertainties by the conditional mutual information and learned to perform aggressively or cautiously based on uncertainty levels.
- Designed, developed, and experimented with the models and training pipelines; conducted 15+ experiments (e.g. planning performance, uncertainty calibration) and visualized robust and exceptional performance of UNREST across diverse driving scenarios; drafted the paper.
- Outperformed state-of-the-art baseline (SPLT) significantly by 11.5% in terms of driving score.

**Skill-Based Offline Motion Planning** Dec 2022 – Sep 2023
Full paper accepted by ICRA'24; the Co-First Author MARSLab, THU

- Introduced a novel skill-based framework enhancing offline RL to overcome the challenge of long-horizon planning in driving environments.
- Employed a two-branch VAE to extract driving skills and visualized them by T-SNE to prove the effectiveness; Conducted motion planning in the CARLA simulator; Drafted the paper and created the demo video to showcase the key ideas and model performance.
- Outperformed state-of-the-art baseline (OPAL) considerably by 11.4% in terms of driving score.

**Training Shift-Robust GNNs via Causal Intervention** Oct 2022 – May 2023
Full paper accepted by WWW'24; the Second Author Thinklab, SJTU

- Proposed a novel approach with an environment estimator and a mixture-of-expert GNN predictor to train robust GNNs under node-level distribution shifts.
- Designed and built GNN-based models and training pipelines; conducted 90+ experiments on six datasets to prove the efficacy of our model for OOD generalization.
- Outperformed state-of-the-art models by 12.9%, showing strong capabilities to generalize results on challenging tasks with significant dataset shift (e.g. node property prediction tasks).

**Debiased Learning and Out-of-Distribution Detection on Graph Data.** Mar 2022 – Sep 2022
Full paper accepted by NeurIPS'22; the Third Author Thinklab, SJTU

- Addressed out-of-distribution challenges on graph data by integrating a unified probabilistic model. Automated outlier identifications during training, and concurrently induced a detector for out-of-distribution detection during testing.
- Preprocessed the datasets and employed different methods to introduce OOD samples. Conducted 15+ experiments and visualized results to show the performance (debiasing and OOD detection) and robustness against baselines.
- Outperformed SOTA results with a great edge. E.g. outperforms by 9.31% on MNIST-75sp in the OOD detection task.

## Internship Experience

**VITA Lab, EPFL** June 2024 – Present
Summer Research Intern, Supervised by Prof. Alexandre Alahi Lausanne, Switzerland

- Researched on data attribution and data selection methods; Conducted experiments and drafted paper.
- Proposed and implement data selection algorithms on motion prediction datasets to improve domain-specific evaluation performance and accelerate the training process.

**Shanghai Qizhi Institute.** July 2023 – Dec 2023
Research Intern, Supervised by Prof. Hang Zhao Shanghai, China

- Led advanced research on autonomous driving prediction and planning tasks. Designed model optimization strategies and adjustments and implemented codebase on Carla simulator and nuPlan dataset.

**Biomap, Inc.** July 2022 – Dec 2022
Algorithm R&D Intern Beijing, China

- Set up the DeepCellState baseline and different types of Attention Free models to predict changes in gene expression levels after drug interference using PyTorch, and tested their performance on large-scale biological datasets.
- Implemented discretization techniques such as equal frequency binning and custom binning to minimize data loss. Finetuned the pretrained model and raised the F1 Score by 6.2%.

## Project Experience

**Graph Neural Networks for Scalable Combinatorial Optimization.** Mar 2023 – June 2023
Research Project in LIONS, EPFL

- Speeded up the decoding process of solving CO problems with a GNN by directly sampling from the learned probabilities and employed a STE to guide the network in making accurate discrete decisions.

## Skills

**Programming Languages**: Python, C++, JavaScript, HTML, CSS
**Tech Skills**: PyTorch, Linux, DeepSpeed, MySQL, Data Visualization, Web Development, Web Crawler

## Professional Service

**Conference Reviewer**: ICRA 2024, Neurips 2025, ICLR 2025