

Faye Nie

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Professional Summary

Graduate student at Stanford with a specialization in **AI/ML**, with a strong focus on **Generative AI**, **Large Language Models** and **Reinforcement Learning**. Skilled in designing, implementing, and optimizing AI models using **Python** and **PyTorch**. Experienced with foundation models finetuning and inference.

Education

Stanford University

Sep 2024 – May 2026 (Expected)

Master in Electrical Engineering (AI Track)

Palo Alto, USA

- Relevant Coursework: CS221 (Artificial Intelligence), 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: Linear Algebra, Statistics, Natural Language Processing, Computer Vision, Artificial Intelligence, Computer Architecture, Computer Networks, Operating Systems and 18 others

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. F. Nie, X. Hou, S. Lin, J. Zou, H. Yao, L. Zhang. **FactTest: Factuality Testing in Large Language Models with Finite-Sample and Distribution-Free Guarantees**. *arXiv preprint arXiv:2411.02603*, 2024.
2. 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).
3. 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).
4. Q. Wu, F. Nie, C. Yang, J. Yan. **Learning Divergence Feilds for Generalization with Data Geometries**. (ICML 2024).
5. 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)*.
6. Q. Wu, W. Zhao, C. Yang, H. Zhang, F. Nie, H. Jiang, Y. Bian, J. Yan. **Simplifying and Empowering Transformers for Large-graph Representations**. (NeurIPS 2023).
7. Z. Li, Q. Wu, F. Nie, J. Yan. **Graphde: A Generative Framework for Debaised Learning and Out-of-distribution Detection on Graphs**. In *Advances in Neural Information Processing Systems (NeurIPS 2022)*.

Research Experience

Factuality Testing in Large Language Models

May 2024 – Oct 2024

Submitted to ICLR2025; the First Author

Rutgers

- Proposed a statistical framework via hypothesis testing to evaluate whether an LLM can confidently provide correct answers to given questions with high-probability correctness guarantees.
- Designed a hypothesis test using Neyman-Pearson classification and leverage uncertainty quantification to control Type I errors, allowing the model to refrain from answering questions when uncertainty is high, improving generation accuracy by over 40% in QA and multiple-choice benchmarks.

Whitening-based Data Attribution and Data Selection

July 2024 – Present

In Submission to CVPR2025; the Co-First Author

VITA, EPFL

- Proposed a gradient-based data attribution algorithm with whitening matrix and cosine similarity.
- Designed and implement an importance-weighted data selection algorithm leveraging attribution scores to select a subset of data that closely matches the target domain's distribution from large-scale datasets.
- Evaluated our proposed method on motion prediction, instruction-tuning and image classification datasets and had SOTA performance. Outperformed models trained on all data with only 5% or 20% data used.
- Accelerated training using PyTorch Lightning for distributed training and faster prototyping.

Uncertainty-Aware Decision Transformer for Driving Environments

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 GPT-based 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 Reinforcement Learning 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 Graph Neural Networks 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

- Contributed to the development of pretraining models on large-scale cell datasets to predict changes in gene expression after drug interference and implementing attention-free models for scalability.
- Collaborated with both technical and biomedical teams to analyze the performance of models on large-scale biological datasets.
- Conducted extensive preprocessing of raw biological data, including cleaning and normalizing.
- Implemented discretization techniques such as equal frequency binning and custom binning to minimize data loss. Tuned hyperparameters, optimizing model performance and improving F1 Score by 6.2%.

Skills

Programming Languages: Python, C++ , JavaScript, HTML, CSS, React, Bash/Shell Script, SQL

Tech Skills: PyTorch, Linux, CUDA, GPU, DeepSpeed, Docker, scikit-learn, Pandas, NumPy, Git, Hugging Face Transformers, ensemble methods, model optimization, post-training methods, data structures

Cloud Platforms: AWS, GCP, Kubernetes

Professional Service

Conference Reviewer: ICRA 2024-2025, NeurIPS 2025, ICLR 2025, AISTATS 2025

Updated on November 6, 2024