Wenqian Ye

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Research Interests

My research interest is to develop interpretable representation learning methods based on the learning theory or probabilistic explanation. I am eager to persistently improve my understanding across various domains with a particular focus on 1). Bayesian Machine Learning, 2). Robustness and Fairness in Machine Learning, 3). AI for Healthcare.

Education

2023 – Now   **PhD in Computer Science**, *School of Engineering and Applied Science*, University of Virginia.
Advisor: Prof. Aidong Zhang

2020 – 2022   **MS in Computer Science**, *Courant Institute of Mathematical Sciences, New York University*.

2017 – 2020   **BS in Mathematics**, University of Illinois Urbana-Champaign, High Distinction.
Minor in Computer Science and Electrical Engineering

Selected Publications

Under Review († denotes co-first authors)

2024   <u>Wenqian Ye</u>, **Guangtao Zheng, Xu Cao, Yunsheng Ma, Xia Hu, Aidong Zhang**, *Spurious Correlations in Machine Learning: A Survey*, Under Review.

2024   **Guangtao Zheng,** <u>Wenqian Ye</u>**, Aidong Zhang**, *Learning Robust Classifiers with Self-Guided Spurious Correlation Mitigation*, Under Review.

2024   **Guangtao Zheng,** <u>Wenqian Ye</u>**, Aidong Zhang**, *Spuriousness-Aware Meta-Learning for Learning Robust Classifiers*, Under Review.

In Proceedings († denotes co-first authors)

2024   **Xu Cao, Tong Zhou, Yunsheng Ma,** <u>Wenqian Ye</u>**, Can Cui, Kun Tang, Zhipeng Cao, Kaizhao Liang, Ziran Wang, James Rehg, Chao Zheng**, MAPLM: A Real-World Large-Scale Vision-Language Dataset for Map and Traffic Scene Understanding, *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*.

2024   **Yunsheng Ma, Can Cui, Xu Cao,** <u>Wenqian Ye</u>**, Peiran Liu, Juanwu Lu, Amr Abdelraouf, Rohit Gupta, Kyungtae Han, Aniket Bera, James Rehg, Ziran Wang**, LaMPilot: An Open Benchmark Dataset for Autonomous Driving with Language Model Programs, *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*.

2024   **Yunsheng Ma, Juanwu Lu, Can Cui, Sicheng Zhao, Xu Cao,** <u>Wenqian Ye</u>**, Ziran Wang**, MACP: Efficient Model Adaptation for Cooperative Perception, *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*.

2023   <u>Wenqian Ye</u>**, Yunsheng Ma, Xu Cao, Kun Tang**, Mitigating Transformer Overconfidence via Lipschitz Regularization, *Conference on Uncertainty in Artificial Intelligence (UAI)*.

2023   <u>Wenqian Ye</u>†**, Xu Cao**†**, Elena Sizikova, Xue Bai, Megan Coffee, Hongwu Zeng, Jianguo Cao** , ViTASD: Robust ViT Baselines for Autism Spectrum Disorder Facial Detection, *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*.

2023   **Xuhui Kang, <u>Wenqian Ye</u>, Yen-Ling Kuo**, Imagined subgoals for hierarchical goal-conditioned policies, *CoRL 2023 Workshop on Learning Effective Abstractions for Planning (LEAP)*.

2023   **Yunsheng Ma, <u>Wenqian Ye</u>, Xu Cao, Amr Abdelraouf, Kyungtae Han, Rohit Gupta, Ziran Wang**, CEMFormer: Learning to Predict Driver Intentions from In-Cabin and External Cameras via Spatial-Temporal Transformers, *IEEE Intelligent Transportation Systems Conference (ITSC)*.

2023   **<u>Wenqian Ye</u>[†], Yunsheng Ma[†], Xu Cao** , Uncertainty Estimation in Deterministic Vision Transformer , *AAAI Workshop on Uncertainty Reasoning and Quantification in Decision Making (UDM-AAAI)*.

2021   **<u>Wenqian Ye</u>, Fei Xu, Yaojia Huang, Cassie Huang, Ji A**, Adversarial Examples Generation for Reducing Implicit Gender Bias in Pre-trained Models, *arXiv*.

2021   **Guoxuan Li, Songmao Zhang, Jiayi Wei, <u>Wenqian Ye</u>** , Combining FCA-Map with Representation Learning for Aligning Large Biomedical Ontologies , *International Semantic Web Conference, Workshop on Ontology Matching (ISWC)*.

Research Experience

NYU Center of Data Science, NYU Langone Health

2022 – 2023   **Improving Tuberculosis Chest X-ray Diagnosis in Limited-resource Areas**.
Proposed a method using the Invertible Vision Transformer (IViT) with self-supervised learning for chest X-ray few-shot learning. Incorporate IViT into different self-supervised joint learning frameworks and demonstrate that mask recovery is particularly well-suited for few-shot domain adaptation using joint mask recovery auxiliary tasks domain alignment. We choose one of the most significant healthcare cases for limited resource areas: tuberculosis (TB) diagnosis for further evaluation. Our results demonstrate that our method achieves state-of-the-art performance in cross-domain few-shot TB detection, outperforming existing few-shot domain adaptation methods.

Advisors :   **Dr. Elena Sizikova**, *Previously Assistant Professor at NYU, now Research Fellow at FDA.*
Dr. Megan Coffee, *Assistant Professor at NYU Grossman School of Medicine.*

IBM-Illinois Center for Cognitive Computing Systems Research (C3SR)

2019 – 2020   **Co-founder**, *LiveSensus*.
Built a machine learning model and open-sourced dataset consisting of 30 hours of audio labeled with MOS scores for quality estimation during Vo-IP. Designed and developed both simulators to re-create quality degradation in videos and audios for dataset and survey launched on AWS and LiveSensus website. Collaborated with four other founders, Professor Sanjay Patel and a leading live streaming company, five founders selected from 40 students under Alchemy Foundry at UIUC Coordinated Science Laboratory(CSL).

Advisor :   **Prof. Sanjay J. Patel**, *Professor of Electrical and Computer Engineering at UIUC.*

Chinese Academy of Science

Jun. 2021 – Aug. 2021   ***Combining FCA-Map with Representation Learning for Aligning Large Biomedical Ontologies***.
Developed FCA-Map to utilize the Formal Concept Analysis (FCA) formalism for incrementally aligning ontologies. Combined FCA-Map with the representation learning technique Siamese BERT to take advantage of the semantic representation in numerical latent space. Evaluated our method on the OAEI 2020 LargeBio small version tasks. Our method obtains the highest recall and F-measure for FMA-NCI (92.3% and 93.9%) and FMA-SNOMED (83.1% and 87.4%)

Advisor :   **Prof. Songmao Zhang**, *Professor at Chinese Academy of Science*

Industrial Experience

2023 – Now   **Adjunct Researcher**, *NYU Langone Health*, New York University.
Conducting research on Artificial Intelligence-enabled diagnosis of Tuberculosis and COVID-19 using radiologic imaging in resource-constrained environments. Additionally, developing an AI algorithmic framework for screening Monkeypox using dermatologic images.

2022 – 2023	**Software Engineer**, *Cirrus Logic Inc.*
	Performed comprehensive validation and testing of embedded software for audio and haptics applications, focusing on automation and analysis. Contributed to both internal and customer-facing UI design, while executing system-level testing across device drivers, firmware, and UI software. Developed prototypes of DSP algorithms using Python/Matlab and implemented fixed-point firmware using C/C++.
2022 – Now	**Co-Founder & Principal Scientist**, *PediaMedAI Lab.*
	Enhancing pediatric healthcare by deploying interpretable AI models designed to support pediatricians in diagnosing and intervening early in pediatric diseases.

Fellowships & Awards

2023	UAI Scholarship
2023	AAAI Student Scholarship Grant
2023	UVA Computer Science Fellowship

Teaching Experience

Fall 2021	**CSCI-GA. 2590: Natural Language Processing**, *Prof. He He* , New York University.
	Graded the written assignments, exams and final projects. Set up the autograder for code assignments. Held the TA section during weekly office hours. Answered questions and provide guidelines for students on the CampusWire forum.

Services

Oraganizer	**Workshops**.
	LLVM-AD (WACV 2024)
Reviewer & PC Member	**Journals**.
	IEEE Internet of Things Journal
	Conferences.
	KDD(2024); CVPR(2024); AAAI(2023); IJCAI(2024); ICML(2022, 2024); ICASSP(2023, 2024); MICCAI(2024); ISBI(2024)
	Workshops.
	MLSP; VTTA(NeurIPS); NIVIT(ICCV); UDM(AAAI, KDD)
Membership	**Member**.
	IEEE; ACM; IEEE SPS
Mentorship	**Mentor**.
	ML4H(2023)

Technical Skills

Languages	Python, C/C++, R, MATLAB, Golang, SystemVerilog, LaTeX
Packages	PyTorch, TensorFlow, PyTorch Lightening, Huggingface, Scikit-learn
Others	AWS, CUDA, MySQL, Git, Jenkins