Xu Zheng

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SUMMARY STATEMENT

Research Scientist Intern candidate with experience in **graph-based modeling, time-series forecasting, and LLM Agents**. Skilled in deep learning optimization and **interpretable AI**, committed to developing scalable, efficient, and reliable machine learning systems that advance real-world applications.

SKILLS

Programming Languages: Python, Java, C/C++   **Languages:** English, Chinese(Native)
Programming Tools: Pytorch, Tensorflow, PyG, OpenCV

EDUCATION

Florida International University   **Miami, FL**
Ph.D. in Computer Science, GPA: 3.97/4.0   *01/2023 - Present*

University of Electronic Science and Technology of China   **Chengdu, China**
M.S. in Control Science and Engineering, GPA: 3.23/4.0   *09/2018 - 06/2021*

Chongqing University   **Chongqing, China**
B.S. in Electronic Science and Technology, GPA: 3.59/4.0   *09/2018 - 06/2021*

EXPERIENCE

DSSS, NEC Laboratories America, Inc   **Princeton, NJ**
Research Scientist Intern   *05/2024 - 08/2024*

- Developed an anomaly detection system combining time-series and textual data, cutting false alarms by 50% through improved cross-modal interactions.
- Designed a multi-modal fusion strategy integrating three complementary detection methods, reducing false alarms by 90% on a real-world dataset via majority voting.

Department of Image Algorithm, ZTE   **Chengdu, China**
Machine Learning Engineer   *07/2021 - 01/2023*

- Built an automated data collection pipeline, capturing 2,000+ images for training, and designed deep neural networks for image restoration in Under-Display Camera (UDC) systems.
- Applied pruning and quantization to optimize Raw Image Denoising Networks, improving inference speed by 25% while reducing model size.
- Deployed and validated optimized neural networks on Android devices using TensorFlow Lite and Qualcomm Snapdragon QNN frameworks.

PROJECTS

Graph for LLMs & Agents   *01/2025 - Present*

- Proposed LM^{2}otifs, an explainable framework for detecting machine-generated texts by modeling linguistic patterns as graph motifs, achieving a 4% accuracy improvement and providing multi-level explanations to enhance interpretability and robustness in LLM text forensics.
- Introduced Environment Copilot, a graph-based diagnostic framework for LLM agents, which models action trajectories as probabilistic graphs to identify error-prone patterns, achieving a 14.7% average improvement in success rate on long-horizon tasks.
- Investigating graph-enhanced scaling laws for LLM agent inference, aiming to systematically improve efficiency, reliability, and decision-making under complex, multi-step environments.

Explainable AI for Scientific Discovery   *01/2024 - Present*

- Compiled and released SF^{2}Bench, a large-scale dataset and benchmark for compound flood forecasting in South Florida, spanning 1985–2024 and covering 2,000+ monitoring stations, enabling fair comparison of data-driven models.
- Planned to integrate explainable AI methods with scientific modeling to improve interpretability and trustworthiness in compound flood prediction.
- Aimed to leverage XAI insights to guide scientific discovery, providing an actionable understanding of key factors driving flood risks and enhancing decision-making in climate resilience.

Robust Evaluation Framework for XAI　　　　　　　　　　　　　　　　　　　*09/2023 - 02/2025*

- Proposed R-Fidelity, a robust evaluation method for assessing the faithfulness of explanations in Graph Neural Networks (GNNs).
- Developed F-Fidelity, a unified framework for robustly evaluating explanation faithfulness across multiple domains, including images, time series, and NLP.
- Advanced the reliability of XAI evaluation by introducing domain-agnostic metrics and benchmarks, enabling fair comparison of explainability methods in real-world settings.

3D Human Mesh Generation　　　　　　　　　　　　　　　　　　　　　　　　*05/2019 - 05/2021*

- Investigated human mesh generation from single images using Conditional GANs and optimization-based methods on the SMPL model.
- Explored multi-view constraint techniques to improve human mesh recovery accuracy.
- Estimated 3D human mesh poses by leveraging 2D keypoints and weak depth supervision.

SELECTED PAPERS

- **Xu Zheng**, Zhuomin Chen, et al., Dongsheng Luo, "Environment Copilot: A Graph-based Framework for Action Error Diagnosis and Decision", Under Review, 2025.
- **Xu Zheng**, Chaohao Lin, et al., Dongsheng Luo, "SF^{2}Bench: Evaluating Data-Driven Models for Compound Flood Forecasting in South Florida", arXiv Preprint, 2025.
- **Xu Zheng**, et al., Wei Cheng, Dongsheng Luo, "LM^{2}OTIFS: An Explainable Framework for Machine-Generated Texts Detection", arXiv Preprint, 2025.
- **Xu Zheng**, Farhad Shirani, Zhuomin Chen, Chaohao Lin, Wei Cheng, Wenbo Guo, Dongsheng Luo, "F-Fidelity: A Robust Framework for Faithfulness Evaluation of Explainable AI", **ICLR**, 2025.
- **Xu Zheng**, Tianchun Wang, Wei Cheng, Aitian Ma, Haifeng Chen, Mo Sha, Dongsheng Luo, "Parametric Augmentation for Time Series Contrastive Learning", **ICLR**, 2024, **IJCAI workshop AI4TS (Best Paper Award)**, 2023.
- **Xu Zheng**[*], Farhad Shirani[*], Tianchun Wang, Wei Cheng, Zhuomin Chen, Haifeng Chen, Hua Wei, Dongsheng Luo, "Towards Robust Fidelity for Evaluating Explainability of Graph Neural Networks", **ICLR**, 2024.
- **Xu Zheng**, et al., Dongsheng Luo, "PAC Learnability under Explanation-Preserving Graph Perturbations", arXiv Preprint, 2024.
- **Xu Zheng**, Tianchun Wang, Samin Yasar Chowdhury, Ruimin Sun, Dongsheng Luo, "Unsafe Behavior Detection with Adaptive Contrastive Learning in Industrial Control Systems", IEEE European Symposium on Security and Privacy **Workshops, EuroS&PW**, 2023.
- **Xu Zheng**, Yali Zheng, Shubing Yang, "Generating Multiple Hypotheses for 3D Human Mesh and Pose using Conditional Generative Adversarial Nets", **ACCV**, 2022.
- Sipeng Chen, **Xu Zheng**, et al., Dongsheng Luo, "Adaptive Dice Loss for Extremely Imbalanced Segemention in Wetland Delineation", **Workshop at ICLR**, 2025.
- Zhuomin Chen, Jingchao Ni, Hojat Allah Salehi, **Xu Zheng**, Dongsheng Luo, "From Binary to Continuous: Stochastic Re-Weighting for Robust Graph Explanation", arXiv Preprint, 2025.
- Zichuan Liu, Tianchun Wang, Jimeng Shi, **Xu Zheng**, et al., Dongsheng Luo, "TimeX++: Learning Time-Series Explanations with Information Bottleneck", **ICML**, 2024
- Zhuomin Chen, Jingchao Ni, Hojat Allah Salehi, **Xu Zheng**, et al., Dongsheng Luo, "Explanation-Preserving Augmentation for Semi-Supervised Graph Representation Learning", arXiv Preprint, 2024.
- Minghao Lin, Minghao Cheng, Yueqi Chen, **Xu Zheng**, Dongsheng Luo, Huajiang Chen, "CLExtract: An End-to-End Tool Decoding Highly Corrupted Satellite Stream from Eavesdropping", **Black Hat USA Arsenal**, 2023.