Dongkuan (DK) Xu **Assistant Professor of Computer Science**

CONTACT INFORMATION

Web: dongkuanx27.github.io/ *Google Scholar:* [Link]
E-mail: dxu27@ncsu.edu *LinkedIn:* [Link]
Twitter: https://twitter.com/DongkuanXu *Updated:* Aug 15th, 2025

RESEARCH INTERESTS

My research is fundamentally grounded in exploring and advancing artificial general intelligence, with particular emphasis on studying the autonomy of intelligent agents, reasoning reliability, and resource efficiency in agentic AI Systems. I'm leading the NCSU Generative Intelligent Computing Lab. My research group provides full-stack solutions, ranging from theoretical optimization methods and data-centric strategies to the development of efficient deep learning techniques and the co-design of algorithms and hardware. My long-term research goal is to liberate AI productivity and democratize its application to serve a broader range of populations and real-world applications, equally, sustainably, and responsibly.

WORKING

Assistant Professor, North Carolina State University, NC, USA. Aug 2022-Present

- Department of Computer Science
- **AAAI Best Demonstration Award 2025**
- **AAAI New Faculty Highlights 2025**
- **NVIDIA Academic Grant Program Award 2025**
- **Microsoft Accelerating Foundation Models Research Award 2024**

EDUCATION

PhD, Penn State University, PA, USA. 2022
MS, University of Chinese Academy of Sciences, Beijing, China 2017
BE, Renmin University of China, Beijing, China 2014

PUBLICATION SUMMARY

Published: 71 papers, including **32 first/advising-authored papers**, and **10 filed patents**.
Impact: 5220 citations (h-index: 23, i10-index: 45, as of Aug 15th, 2025).
My publications span leading venues such as **NeurIPS, ICLR, AAAI, CVPR, ECCV, ICCV, ACL, EMNLP, and NAACL**, and can be broadly categorized as follows (with a representative paper in each category).

- **Improving Computation Efficiency of Deep Learning Models** [24][39][40][46][47][12]

  I developed methods that significantly reduce the computation cost of large-scale model training and inference while maintaining accuracy.

  — X. Liu, B. Lei, R. Zhang, **D. Xu**. *Adaptive Draft-Verification for Efficient Large Language Model Decoding*. **AAAI 2025 (Oral Paper Award)**. [Project Link], [Paper Link]

- **Improving Data Efficiency in Deep Learning Models** [28][23][49][55][57][61][62][64]

  My work advanced dataset distillation and augmentation techniques, enabling high-performing models even with limited training data.

  — L. Zhang, J. Zhang, B. Lei, S. Mukherjee, X. Pan, B. Zhao, C. Ding, Y. Li, **D. Xu**. *Accelerating Dataset Distillation via Model Augmentation*. **CVPR 2023 (Highlight Paper Award)**. [Project Link], [Paper Link]

- **Improving Parameter Efficiency in Deep Learning Models** [27][31][45][48][50][53][54][59]

  I introduced pruning and distillation frameworks that produce compact yet accurate deep learning models for real-world deployment.

  — **D. Xu**, I. Yen, J. Zhao, Z. Xiao. *(SparseBERT) Rethinking Network Pruning - under the Pre-Train and Fine-Tune Paradigm*. **NAACL 2021**. [Project Link], [Paper Link]

Current Projects

Harnessing Links between Historical Business & Household Microdata and Street-View Images to Assess Transit-Induced Neighborhood Changes at Small Spatial Scales

- Source of Support: NSF
- Project Start Date: 08/2024
- Project End Date: 08/2027
- PI: Eleni Bardaka (NC State, Civil Engineering)
- Co-PI: DK Xu (NC State, Computer Science)
- Total Project Amount: $396,600

Collaborative Research: CyberTraining: Implementation: Medium: EcoTern: Pioneering a CI Workforce for Sustainable and Transdisciplinary Environmental Science Research

- Source of Support: NSF
- Project Start Date: 12/2024
- Project End Date: 11/2027
- NCSU Team: Xipeng Shen (PI, Systems), DK Xu (Co-PI, AI), Roy He (Co-PI, Ocean)
- FIU Team: Wenqian Dong (PI, HPC), J. Obey (Co-PI, Climate), J. Liu (Co-PI, Simulation)
- Total Project Amount: $979,901

MerryQuery in Practice: Scaling and Evaluating a Trustworthy, Course-Aligned AI Assistant for Teaching and Learning

- Source of Support: NC State DELTA Grants Programs
- Project Start Date: 09/2025
- Project End Date: 06/2026
- PI: Tiffany Barnes (NC State, CS Education)
- Co-PI: DK Xu (NC State, Artificial Intelligence)
- Co-PI: Lina Battestilli (NC State, CS Education)
- Total Project Amount: $8,000

Transforming Learning Through AI, Hands-On Computational Creativity, & Digital Art

- Source of Support: NC State TELS Department
- Project Start Date: 05/2025
- Project End Date: 08/2025
- PI: Joey Huang (NC State, Computational Thinking and Educational Tech)
- Co-PI: DK Xu (NC State, Artificial Intelligence)
- Total Project Amount: $1,600

Orchestrating Multi-Level Network Modeling and Scientific Simulation with LLMs

- Source of Support: NVIDIA Academic Grant Program
- Project Start Date: 03/2025
- Project End Date: 09/2025
- PI: Yuchen Liu (NC State, Networking and Systems)
- Co-PI: DK Xu (NC State, Artificial Intelligence)
- Total Project Amount: $20,000 (A100 GPU-Hours)

Completed Projects

Developing Responsible AI Agents for Interpreting and Enhancing Access to Large Environmental Datasets

- Source of Support: NC State Data Science and AI Academy
- Project Start Date: 12/2024
- Project End Date: 06/2025
- PI: Paul Liu (NC State, Marine, Earth, and Atmospheric Sciences)
- Co-PI: DK Xu (NC State, Artificial Intelligence)
- Co-PI: Alice Cheng (NC State, Communication)

- Total Project Amount: $30,000

Scalable and Adaptable Evaluation of LLMs' Trustworthiness Through Generative Techniques
- Source of Support: Microsoft Accelerating Foundation Models Research
- Project Start Date: 01/2024
- Project End Date: 06/2025
- Single PI: DK Xu (NC State, Computer Science)
- Total Project Amount: $50,000

COMMUNITY ENGAGEMENT

- Workshop on DL-Hardware Co-Design for Generative AI Acceleration @DAC'25, Chair
- 3rd Resource-efficient Learning for Knowledge Discovery Workshop @KDD'25, Co-Chair
- Workshop on DL-Hardware Co-Design for Generative AI Acceleration @DAC'24, Chair
- Workshop on Dataset Distillation for Computer Vision @CVPR'24, Co-Chair
- 2nd Resource-efficient Learning for Knowledge Discovery Workshop @KDD'24, Co-Chair
- 1st Workshop on DL-Hardware Co-Design for AI Acceleration @AAAI'23, Chair
- 1st Resource-Efficient Learning for Knowledge Discovery Workshop @KDD'23, Co-Chair
- ML & NLP Learning Community (Chinese), Founding Committee Member
- ACM SIGAI Newsletter, Column Editor
- NSF CAREER Panel Reviewer, 2023
- Area Chair, Session Chair, (Senior) Program Committee Member for $\geq$ 50 times

EDUCATION OUTREACH

- NCSU GEARS Program Spring, Summer 2025, Research Mentor
- Grand Challenges Scholars Program (GCSP-REU) Summer 2024, Research Mentor
- NCSU Educational Workshops (Integrating ChatGPT into K-12 Classrooms), Co-Chair
- NSF REU Site (SRCA, Socially Relevant Computing and Analytics), UG Mentor
- NCSU CSC 298 (Introduction to Computer Science Research Methods), Mentor (2 UGs)
- NCSU COE REU Program, UG Mentor (**$3,000 Research Award awarded to my student**)
- NSF-funded IUSE project (ExplainIt), UG Class Instructor
- NSF REU Site proposal (Topic: Algorithms and Theory), Mentor (2 UGs for 3-5 years)

OPEN-SOURCE PROJECT

Gentopia.AI: A Collaborative Platform for Tool-Augmented LLMs
- **Goal:** Aim to specialize & share agents to overlay collective growth for greater intelligence
- **Teams:** Researchers from NC State, George Mason, NYU, UMich, CMU
- **Web:** https://github.com/Gentopia-AI, **Demo** [link], **Quick Start** [link]
- **Paper:** Accepted to EMNLP'23 (System Demo) [link]

PEER-REVIEWED CONFERENCE AND JOURNAL PAPERS

[1] H. Huang, **D. Xu**, H. Zhang, P. Gao. Non-Overlap-Aware Egocentric Pose Estimation for Collaborative Perception in Connected Autonomy [C]. The 2025 IEEE/RSJ International Conference on Intelligent Robots and Systems **(IROS'25 (Findings))**

[2] C. Shen, Z. Chen, D. Luo, **D. Xu**, H. Chen, J. Ni. Exploring Multi-Modal Integration with Tool-Augmented LLM Agents for Precise Causal Discovery [C]. The 63rd Annual Meeting of the Association for Computational Linguistics **(ACL'25 (Findings))**

[3] Z. Kong, **D. Xu**, Z. Li, P. Dong, H. Tang, Y. Wang, S. Mukherjee. AutoViT: Achieving Real-Time Vision Transformers on Mobile via Latency-aware Coarse-to-Fine Search [J]. International Journal of Computer Vision

[4] Z. Peng, Y. Liu, G. Li, Z. Yang, M. Chen, **D. Xu**, X. Lin. Generative Artificial Intelligence Models for Emerging Communication Systems: Fundamentals and Challenges [J]. IEEE Communications Magazine

[5] C. Egersdoerfer, A. Sareen, J. L. Bez, S. Byna, **D. Xu**, D. Dai. Augmenting LLMs for HPC I/O Performance Diagnosis [C]. The 37th International Conference on Scalable Scientific Data Management **(SSDBM'25)**

[6] B. Tabarsi, A. Basarkar, X. Liu, **D. Xu**, T. Barnes. MerryQuery: A Trustworthy LLM-Powered Tool Providing Personalized Support for Educators and Students [C]. The 39th Annual AAAI Conference on Artificial Intelligence (Demo Track) **(AAAI'25 (Demo Track))**

[7] X. Liu, B. Lei, R. Zhang, **D. Xu**. Adaptive Draft-Verification for Efficient Large Language Model Decoding [C]. The 39th Annual AAAI Conference on Artificial Intelligence **(AAAI'25)**

[8] X. Liu, H. Lv, F. Ma, C. Wang, **D. Xu**. DyESP: Accelerating Hyperparameter-Architecture Search via Dynamic Exploration and Space Pruning [C]. The 39th Annual AAAI Conference on Artificial Intelligence Spring Symposium **(AAAI Spring Symposium'25)**

[9] C. Egersdoerfer, A. Sareen, J. Bez, S. Byna, **D. Xu**, D. Dai. IOAgent: Democratizing Trustworthy HPC I/O Performance Diagnosis Capability via LLMs [C]. The 39th IEEE International Parallel & Distributed Processing Symposium **(IPDPS'25)**

[10] C. Zeng, S. Tang, X. Yang, Y. Chen, Y. Sun, Z. Xu, Y. Li, H. Chen, W. Cheng, **D. Xu**. Improving Logits-based Detector without Logits from Black-box LLMs [C]. The 38th Annual Conference on Neural Information Processing Systems **(NeurIPS'24)**

[11] H. Reichert, B. Tabarsi, Z. Zhang, C. Fennell, I. Bhandari, D. Robinson, M. Drayton, C. Crofton, M. Lococo, **D. Xu**, T. Barnes. Empowering Secondary School Teachers: Creating, Executing, and Evaluating a Transformative Professional Development Course on ChatGPT [C]. IEEE Frontiers in Education Conference 2024 **(FIE'24)**

[12] S. Tang, Y. Wang, C. Ding, Y. Liang, Y. Li, and **D. Xu**. AdaDiff: Accelerating Diffusion Models through Step-Wise Adaptive Computation [C]. The 18th European Conference on Computer Vision **(ECCV'24)**

[13] J. Liu, Z. Peng, **D. Xu**, Y. Liu. Revolutionizing Wireless Modeling and Simulation with Network-Oriented LLMs [C]. The 43rd IEEE International Performance Computing and Communications Conference **(IPCCC'24)**

[14] Z. Zhang, Y. Liu, Z. Peng, M. Chen, **D. Xu**, and S. Cui. Digital Twin-Assisted Data-Driven Optimization for Reliable Edge Caching in Wireless Networks [J]. IEEE Journal on Selected Areas in Communications **(IEEE JSAC, 2024, Impact Factor is 16.4)**

[15] P. Dong, J. Zhuang, Z. Yang, S. Ji, Y. Li, **D. Xu**, H. Huang, J. Hu, A. Jones, Y. Shi, Y. Wang, P. Zhou. EQ-ViT: Algorithm-Hardware Co-Design for End-to-End Acceleration of Real-Time Vision Transformer Inference on Versal ACAP Architecture [C]. The International Conference on Hardware/Software Codesign and System Synthesis **(CODES+ISSS'24)**

[16] X. Wang, S. Duan, X. Yi, J. Yao, S. Zhou, Z. Wei, P. Zhang, **D. Xu**, M. Sun, X. Xie. On the Essence and Prospect: An Investigation of Alignment Approaches for Big Models [C]. International Joint Conference on Artificial Intelligence (Survey Track) **(IJCAI'24)**

[17] Y. Wang, Q. Zhao, **D. Xu**, and X. Liu. Purpose Enhanced Reasoning through Iterative Prompting: Uncover Latent Robustness of ChatGPT on Code Comprehension [C]. 2024 International Joint Conference on Artificial Intelligence **(IJCAI'24)**

[18] X. Luo, Z. Li, Z. Peng, **D. Xu**, Y. Liu. RM-Gen: Conditional Diffusion Model-Based Radio Map Generation for Wireless Networks [C]. International Federation for Information Processing Networking Conference **(IFIP/IEEE Networking'24)**

[19] B. Lei, **D. Xu**, R. Zhang, and B.K Mallick. Embracing Unknown Step by Step: Towards Reliable Sparse Training in Real World [J]. **(Transactions on Machine Learning Research, 2024)**

[20] B. Lei, **D. Xu**, R. Zhang, S. He, B. K. Mallick. Balance is Essence: Accelerating Sparse Training via Adaptive Gradient Correction [C]. The 2024 Conference on Parsimony and Learning **(CPAL'24)**

[21] Z. Zhang*, Z. Dong*, Y. Shi, N. Matsuda, T. Price, **D. Xu**. Students' Perceptions and Preferences of Generative Artificial Intelligence Feedback for Programming [C]. The 14th Symposium on Educational Advances in Artificial Intelligence **(AAAI/EAAI'24)**

[22] Z. Wang, Q. Zhao, J. Cui, X. Liu, and **D. Xu**. AutoST: High-performance and Energy-efficient Spiking Transformer Architecture Search [C]. The 2024 IEEE International Conference on Acoustics, Speech, and Signal Processing **(ICASSP'24)**

[23] L. Zhang, J. Zhang, B. Lei, S. Mukherjee, X. Pan, B. Zhao, C. Ding, Y. Li, and **D. Xu**. Accelerating Dataset Distillation via Model Augmentation [C]. The 34th IEEE/CVF Conference on Computer Vision and Pattern Recognition **(CVPR'23, Highlight Paper**) Acceptance rate: **235/9155=2.5%**

[24] S. Tang, Y. Wang, Z. Kong, T. Zhang, Y. Li, C. Ding, Y. Wang, Y. Liang, and **D. Xu**. You Need Multiple Exiting: Dynamic Early Exiting for Accelerating Unified Vision Language Model [C]. The 34th IEEE/CVF Conference on Computer Vision and Pattern Recognition **(CVPR'23)**

[25] B. Xu, X. Liu, H. Shen, Z. Han, Y. Li, M. Yue, Z. Peng, Y. Liu, Z. Yao, and **D. Xu**. Gentopia: A Collaborative Platform for Tool-Augmented LLMs [C]. The 2023 Conference on Empirical Methods in Natural Language Processing. **(EMNLP'23, System Track)**

[26] J. Li, Q. Lei, W. Cheng, and **D. Xu**. Towards Robust Pruning: An Adaptive Knowledge-Retention Pruning Strategy for Language Models [C]. The 2023 Conference on Empirical Methods in Natural Language Processing. **(EMNLP'23)**

[27] J. Li, W. Gao, Q. Lei, and **D. Xu**. Breaking through Deterministic Barriers: Randomized Pruning Mask Generation and Selection [C]. The 2023 Conference on Empirical Methods in Natural Language Processing. **(EMNLP'23, Findings)**

[28] J. Gu, Z. Nan, Z. Peng, X. Shen, and **D. Xu**. Co-evolving Data-driven and NLU-driven Synthesizers for Generating Code in Domain Growth and Data Scarcity [C]. The 2023 Conference on Empirical Methods in Natural Language Processing. **(EMNLP'23, PanDL Workshop)**

[29] D. Zhu, B. Lei, J. Zhang, Y. Fang, Y. Xie, R. Zhang, and **D. Xu**. Rethinking Data Distillation: Do Not Overlook Calibration [C]. International Conference on Computer Vision **(ICCV'23)**

[30] J. Wang, X. Yang, S. Cui, L. Che, L. Lyu, **D. Xu**, and F. Ma. Towards Personalized Federated Learning via Heterogeneous Model Reassembly [C]. The 37th Annual Conference on Neural Information Processing Systems **(NeurIPS'23)**

[31] S. Li, H. Mei, J. Li, H. Wei, and **D. Xu**. Toward Efficient Traffic Signal Control: Smaller Network Can Do More [C]. 62nd IEEE Conference on Decision and Control **(CDC'23)**

[32] B. Lei, R. Zhang, **D. Xu**, and B. K Mallick. Calibrating the Rigged Lottery: Making All Tickets Reliable [C]. The 11th International Conference on Learning Representations **(ICLR'23)**

[33] Q. Zhang, S. Chen, **D. Xu**, Q. Cao, X. Chen, T. Cohn, and M. Fang. A Survey for Efficient Open Domain Question Answering [C]. The 61th Annual Meeting of the Association for Computational Linguistics **(ACL'23)**

[34] L. Wu, B. Lei, **D. Xu**, and D. Zhou. Towards Reliable Rare Category Analysis on Graphs via Individual Calibration [C]. The 29th ACM SIGKDD Conference on Knowledge Discovery and Data Mining **(KDD'23)**

[35] C. Liu, D. Doshi, M. Bhargava, R. Shang, J. Cui, **D. Xu**, and E. Gehringer. Labels Are Not Necessary: Assessing Peer-Review Helpfulness Using Domain Adaptation Based on Self-Training [C]. The 18th Workshop on Innovative Use of NLP for Building Educational Applications **(BEA'23)**

[36] Z. Dong, **D. Xu**. Exploring the Augmented Large Language Model with Mathematical tools in Personalized and Efficient Education [C]. The 6th International Conference on Artificial Intelligence and Big Data **(ICAIBD'23)**

[37] Y. Liu, M. Chen, **D. Xu**, Z. Yang, and S. Zhao. E-App: An Environment-Aware Access Point Planning Framework for mmWave Wireless LANs [C]. The 32nd International Conference on Computer Communications and Networks **(ICCCN'23, Best Paper Award)**

[38] Y. X., D. Zhu, B. Lei, **D. Xu**, and R. Zhang. Efficient Informed Proposals for Discrete Distributions via Newton's Series Approximation [C]. The 26th International Conference on Artificial Intelligence and Statistics **(AISTATS'23)**

[39] S. Huang, H. Fang, K. Mahmood, B. Lei, N. Xu, B. Lei, Y. Sun, **D. Xu**, Wu. Wen, and C. Ding. Neurogenesis Dynamics-inspired Spiking Neural Network Training Acceleration [C]. The 60th Design Automation Conference **(DAC'23)**

[40] S. Huang, B. Lei, **D. Xu**, H. Peng, Y. Sun, M. Xie, and C. Ding. Dynamic Sparse Training via Balancing the Exploration-Exploitation Trade-off [C]. The 60th Design Automation Conference **(DAC'23)**

[41] J. Li, T. Zhang, E. Yan, and **D. Xu**. FP8-BERT: Post-Training Quantization for Transformer [C]. The 1st Workshop on DL-Hardware Co-Design for AI Acceleration **(DCAA'23)**

[42] Y. Xie, Z. Li, H. Bao, X. Jia, **D. Xu**, X. Zhou, and S. Skakun. Auto-CAM: Label-Free Earth Observation Imagery Composition and Masking Using Spatio-Temporal Dynamics [C]. The 37th AAAI International Conference on Artificial Intelligence **(AAAI'23)**

[43] D. Luo, W. Cheng, Y. Wang, **D. Xu**, J. Ni, W. Yu, X. Zhang, Y. Liu, Y. Chen, H. Chen, and X. Zhang. Time Series Contrastive Learning with Information-Aware Augmentations [C]. The 37th AAAI International Conference on Artificial Intelligence **(AAAI'23)**

[44] Y. Tian, W. Gao, Q. Zhang, P. Sun, and **D. Xu**. Improving long-tailed classification by disentangled variance transfer [J]. **Internet of Things (2023)**: 100687.

[45] **D. Xu**, S. Mukherjee, X. Liu, D. Dey, W. Wang, X. Zhang, A. H. Awadallah, and J. Gao. Few-shot Task-agnostic Neural Architecture Search for Distilling Large Language Models [C]. The 36th Annual Conference on Neural Information Processing Systems **(NeurIPS'22)**

[46] I. Yen, Z. Xiao, and **D. Xu**. S4: a High-sparsity, High-performance AI Accelerator [C]. Sparsity in Neural Networks 2022 Workshop **(SNN'22)**

[47] S. Huang, N. Liu, Y. Liang, H. Peng, H. Li, **D. Xu**, M. Xie, and C. Ding. An Automatic and Efficient BERT Pruning for Edge AI Systems [C]. The 23rd IEEE International Society for Quality Electronic Design **(ISQED'22)**

[48] S. Huang*, **D. Xu***, I. Yen, S. Chang, B. Li, S. Chen, M. Xie, H. Liu, and C. Ding. Sparse Progressive Distillation: Resolving Overfitting under Pretrain-and-Finetune Paradigm [C]. The 60th Annual Meeting of the Association for Computational Linguistics **(ACL'22)** Acceptance rate: 714/3350=21.3%

[49] **D. Xu**, W. Cheng, D. Luo, H. Chen, and X. Zhang. InfoGCL: Information-Aware Graph Contrastive Learning [C]. The 35th Annual Conference on Neural Information Processing Systems **(NeurIPS'21)**
Acceptance rate: 2372/9122=26.0%

[50] **D. Xu**, I. Yen, J. Zhao, and Z. Xiao. Rethinking Network Pruning - under the Pre-train and Fine-tune Paradigm [C]. 2021 Annual Conference of the North American Chapter of the Association for Computational Linguistics **(NAACL-HLT'21)**
Acceptance rate: 477/1797=26.5%

[51] X. Dong, Y. Zhu, Z. Fu, **D. Xu**, and G. de Melo. Data Augmentation with Adversarial Training for Cross-Lingual NLI [C]. The 59th Annual Meeting of the Association for Computational Linguistics **(ACL'21)**
Acceptance rate: 714/3350=21.3%

[52] **D. Xu**, W. Cheng, J. Ni, D. Luo, Masanao Natsumeda, D. Song, B. Zong, H. Chen, and X. Zhang. Deep Multi-Instance Contrastive Learning with Dual Attention for Anomaly Precursor Detection [C]. The 21th SIAM International Conference on Data Mining **(SDM'21)**
Acceptance rate: 85/400=21.3%

[53] **D. Xu**, W. Cheng, X. Dong, B. Zong, W. Yu, J. Ni, D. Song, X. Zhang, H. Cheng, and X. Zhang. Multi-Task Recurrent Modular Networks [C]. The 35th AAAI International Conference on Artificial Intelligence **(AAAI'21)**
Acceptance rate: 1692/7911=21.4%

[54] **D. Xu**, J. Liang, W. Cheng, H. Wei, H. Cheng, and X. Zhang. Transformer Style Relational Reasoning with Dynamic Memory Updating for Temporal Network Modeling [C]. The 35th AAAI International Conference on Artificial Intelligence **(AAAI'21)**
Acceptance rate: 1692/7911=21.4%

[55] H. Wei, **D. Xu**, J. Liang, and Z. Li. How Do We Move: Modeling Human Movement with System Dynamics [C]. The 35th AAAI International Conference on Artificial Intelligence **(AAAI'21)**
Acceptance rate: 1692/7911=21.4%

[56] J. Liang, Y. Wu, **D. Xu**, and V. Honavar. Longitudinal Deep Kernel Gaussian Process Regression [C]. The 35th AAAI International Conference on Artificial Intelligence **(AAAI'21)**
Acceptance rate: 1692/7911=21.4%

[57] D. Luo, W. Cheng, **D. Xu**, W. Yu, B. Zong, H. Chen, and X. Zhang. Parameterized Explainer for Graph Neural Network [C]. The 34th Annual Conference on Neural Information Processing Systems **(NeurIPS'20)**
Acceptance rate: 1900/9454=20.1%

[58] X. Dong, Y. Zhu, Y. Zhang, Z. Fu, **D. Xu**, S. Yang, and G. de Melo. Leveraging Adversarial Training in Self-Learning for Cross-Lingual Text Classification [C]. The 43rd International ACM SIGIR Conference on Research and Development in Information

Retrieval **(SIGIR'20)**
Acceptance rate: 300/1062=28.2%

[59] **D. Xu**, W. Cheng, B. Zong, D. Song, J. Ni, W. Yu, Y. Liu, H. Chen, and X. Zhang. Tensorized LSTM with Adaptive Shared Memory for Learning Trends in Multivariate Time Series [C]. The 34th AAAI International Conference on Artificial Intelligence **(AAAI'20)**
Acceptance rate: 1591/7737=20.6%

[60] J. Liang, **D. Xu**, Y. Sun, and V. Honavar. Longitudinal Multi-Level Factorization Machines [C]. The 34th AAAI International Conference on Artificial Intelligence **(AAAI'20)**
Acceptance rate: 1591/7737=20.6%

[61] **D. Xu**, W. Cheng, D. Luo, X. Liu, and X. Zhang. Spatio-Temporal Attentive RNN for Node Classification in Temporal Attributed Graphs [C]. The 28th International Joint Conference on Artificial Intelligence **(IJCAI'19)**
Acceptance rate: 850/4752=17.9%

[62] **D. Xu**, W. Cheng, D. Luo, Yameng Gu, X. Liu, J. Ni, B. Zong, H. Chen, and X. Zhang. Adaptive Neural Network for Node Classification in Dynamic Networks [C]. The 19th IEEE International Conference on Data Mining **(ICDM'19)**
Acceptance rate: 183/930=19.7%

[63] **D. Xu**, W. Cheng, B. Zong, J. Ni, D. Song, W. Yu, Y. Chen, H. Chen, and X. Zhang. Deep Co-Clustering [C]. The 19th SIAM International Conference on Data Mining **(SDM'19)**
Acceptance rate: 90/397=22.7%

[64] J. Ni, S. Chang, X. Liu, W. Cheng, H. Chen, **D. Xu**, and X. Zhang. Co-Regularized Deep Multi-Network Embedding [C]. The 27th International Conference on World Wide Web **(WWW'18)**
Acceptance rate: 170/1175=14.5%

[65] Y. Tian, **D. Xu**, and C. Zhang. A Review of Multi-Instance Learning Research [J]. Operations Research Transactions, 2018, 02: 1-17

[66] **D. Xu**, J. Wu, D. Li, Y. Tian, X. Zhu, and X. Wu. SALE: Self-Adaptive LSH Encoding for Multi-Instance Learning [J]. **Pattern Recognition**, 2017 **(7.74 impact factor)**

[67] D. Li, **D. Xu**, J. Tang, and Y. Tian. Metric Learning for Multi-Instance Classification with Collapsed Bags [C]. The 30th IEEE International Joint Conference on Neural Networks **(IJCNN'17)**

[68] D. Li, W. Zhang, **D. Xu**, and Y. Tian. Multi-Metrics Classification Machine [C]. International Conference on Information Technology and Quantitative Management **(ITQM'16)**

[69] **D. Xu**, and Y. Tian. A Comprehensive Survey of Clustering Algorithms [J]. Annals of Data Science, 2015, 2(2): 165-193

[70] **D. Xu**, T. Chen, and W. Xu. A Support Vector Machine-Based Ensemble Prediction for Crude Oil Price with VECM and STEPMRS [J]. International Journal of Global Energy Issues, 2015

[71] **D. Xu**, Y. Zhang, C. Cheng, W. Xu, and L. Zhang. A Neural Network-Based Ensemble Prediction Using PMRS and ECM [C]. The 47th IEEE Hawaii International Conference on System Sciences **(HICSS'14)**

Industry Experience

Microsoft Research (MSR), Redmond, WA — 2021
- Research Intern, Mentors: Subho Mukherjee, X. Liu, D. Dey, A. H. Awadallah, J. Gao
- Project: Task-agnostic Auto-Transformer Search [NeurIPS 2022]

Moffett.AI, Los Altos, CA — 2020
- Research Intern, Mentor: I. Yen, Co-founder
- Project: Data-free Model Compression [NAACL 2021 & a U.S. patent]

NEC Labs America, Princeton, NJ — 2019
- Research Intern, Mentor: W. Cheng
- Project: Knowledge Transfer in Multi-Task Learning [AAAI 2021]
- Project: Trend Learning in Multivariate Time Series [AAAI 2020]

NEC Labs America, Princeton, NJ — 2018
- Research Intern, Mentor: W. Cheng, Senior Researcher
- Project: Contrastive Anomaly Detection [SDM 2021]

Academia Experience

Penn State University — 2017-2022
- Graduate Research Assistant, Adviser: X. Zhang
- Thesis: Resource-efficient Deep Learning: Democratizing AI at Scale

Chinese Academy of Sciences, Beijing, China — 2014-2017
- Graduate Research Assistant, Adviser: Y. Tian
- Thesis: Efficient Multi-instance Learning

Renmin University of China, Beijing, China — 2012-2014
- Undergraduate Research Assistant, Adviser: W. Xu
- Thesis: Ensemble Forecasting Model for Time Series Data

Teaching Experience

Instructor at NC State

- CSC 422: Automated Learning and Data Analysis — Spring'23, Fall'24, 25
  Course Materials: Introduction to Data Mining (Second Edition)
- CSC 791&591: Advanced Topics in Efficient Deep Learning — Fall'22, 23, Spring'24, 25
  Course Materials: Dive into Deep Learning

Teaching Assistant at Penn State

- SRA 268, Visual Analytics — Fall 2021
  Instructor: Prof. Mahir Akgun
  Course Materials: Visual Analytics with Tableau
  (Responsible for teaching lab classes of 46 students)
- SRA 450, Cybercrime and Cyberwar — Fall 2021
  Instructor: Prof. John Hodgson
  Course Materials: Cybersecurity: What Everyone Needs to Know
- DS/CMPSC 410, Programming Models for Big Data — Spring 2021
  Instructor: Prof. John Yen
  Course Materials: Learning Spark
- SRA 365, Statistics for Security and Risk Analysis — Fall 2020
  Instructor: Dr. James Farrugia
  Course Materials: Discovering Statistics Using R

- DS 402, Introduction to Social Media Mining — Spring 2020
  Instructor: Prof. Suhang Wang
  Course Materials: Social Media Mining: An Introduction
- SRA 365, Statistics for Security and Risk Analysis — Spring 2019
  Instructor: Dr. Katherine Hamilton
  Course Materials: Foundations and Practice of Intermediate Statistics
- IST 210, Organization of Data — Fall 2018
  Instructor: Prof. X. Zhang
  Course Materials: Database Systems Concepts
  (The Award for Excellence in Teaching Support)

Guest Lecturer

- COSI 133A, Graph Mining — Fall 2021
  Brandeis University, Slides [Link]
- COSI 165B, Deep Learning — Spring 2021
  Brandeis University, Slides: [Link]

Mentoring Experience

Ph.D. Students

- Muhammad Alahmadi
  Research Interest: Improving Data-Centric Reliability in LLMs
  M.S.: North Carolina State University, USA
  B.S.: King Fahd University of Petroleum and Minerals (Second Honors), Saudi Arabia
- Li-Chia (Jerry) Chang
  Research Interest: Accelerating Agentic LLM-Powered Agents
  M.S.: North Carolina State University, USA
- Bowen (Berwin) Chen (co-advised with Drs. Roy He and Paul Liu)
  Research Interest: Advancing Generative Models for Environmental Intelligence
  M.S.: University of Birmingham, United Kingdom
  B.S.: Hohai University, China
- Travis Thompson
  Research Interest: Reliable Foundation Models for Scientific Discovery
  B.S.: Auburn University (Undergraduate Research Fellow), USA
- Benyamin T. Tabarsi (co-advised with Dr. Tiffany Barnes)
  Research Interest: LLM-Powered Trustworthy Agents for Personalized Learning
  M.S.: Science and Research Branch of Azad University, Iran
  B.S.: University of Mazanadran, Iran

Undergraduate Researchers

- Aditya Basarkar
  Research Interest: LLM-Powered Complex Mathematical Reasoning
  B.S.: North Carolina State University (Dean's List, GPA: 3.974), USA
  Majors: B.S. in Computer Science, B.S. in Statistics
- Precious Donkor
  Research Interest: Exploring and Mitigating Implicit Bias in Large Language Models
  B.S.: North Carolina State University (GPA: 3.9), USA
  Achievements: i) Federal Work-Study Award, ii) NC State COE REU Award
  Publication: AAAI 2025 Undergraduate Consortium

Master Students

- Nitya Naga Sai Atluri

Research Interest: Unveiling Implicit Bias in LLM-Generated Educational Materials
B.S.: Koneru Lakshmaiah Education Foundation - Andhra Pradesh, India

- Xinyuan (Teddy) Chen
  Research Interest: Trustworthiness Evaluation of LLMs
  B.S.: Fudan University, China
- Vignes KV
  Research Interest: Deep Learning Algorithms for Super-Resolution Image Denoising
  B.S.: North Carolina State University (University Honors Program Scholar), USA
- Harsh Mauny
  Research Interest: AI & Humans Co-Design Artistic Creations
  B.S.: Sardar Vallabhbhai Patel Institute of Technology, India
- Homak Patel
  Research Interest: Reliable Retrieval-Augmented Generation for Education
  B.S.: Ahmedabad University, Gujarat, India

Alumni

- Zhiyuan Peng, Postdoc, 2023-2024, now Meta
  Topic: Tool-Augmented Large Language Model
- Shengkun Tang, PhD, 2023-2023, now MBZUAI
  Topic: Multi-Modal Foundation Models
- Chengyuan Liu, PhD, 2022-2024
  Topic: Data-Efficient Large Language Models for Education
- Zihan (Z) Dong, Undergraduate, 2023-2024, now Georgia Tech
  Topic: Reliable Large Language Models for Education
- John Zhu, Master, 2024, now NC State
  Topic: Trustworthy Evaluation of LLMs
- Bowen Lei, Intern, 2022-2024, now Apple
  Topic: Theoretical Foundations of Efficient Learning
- Zhengdong Zhang, Intern, 2023-2024, now Amazon
  Topic: Reliable Large Language Models for Education
- Binfeng Xu, Intern, 2023-2023, now Samsung
  Topic: Tool-Augmented Large Language Model

PROFESSIONAL SERVICE

Panel Reviewer

- NSF EDU Program, 2025
- NSF CORE Program, 2024
- NSF CAREER Program, 2023

Column Editor

- ACM SIGAI Newsletter

Workshop Chair & Co-Chair

- The 2nd Workshop on DL-Hardware Co-Design for Generative AI Acceleration @DAC2025
- The 3rd Workshop on Resource-Efficient Learning for Knowledge Discovery @KDD2025
- The 1st Workshop on DL Co-Design for Generative AI Acceleration @DAC2024
- The First Workshop on Dataset Distillation for Computer Vision @CVPR2024
- The 2nd Workshop on Resource-Efficient Learning for Knowledge Discovery @KDD2024
- The 1st Workshop on DL-Hardware Co-Design for AI Acceleration @AAAI2023
- The 1st Workshop on Resource-Efficient Learning for Knowledge Discovery @KDD2023

Session Chair
- Scalable, Distributed Systems & Trustable AI @KDD2022
- Deep Learning: New Architectures and Models @KDD2022

Academic Committee Member
- Machine Learning & Natural Language Processing Community (MLNLP)

Area Chair
- The Joint International Conference on Computational Linguistics, Language Resources and Evaluation (LREC-COLING) 2024

Senior Program Committee
- AAAI Conference on Artificial Intelligence (AAAI) 2024, 2025
- International Joint Conferences on Artificial Intelligence (IJCAI) 2021

Program Committee
- Neural Information Processing Systems (NeurIPS) 2020, 2021, 2022, 2023, 2024, 2025
- International Conference on Learning Representations (ICLR) 2021, 2022, 2023, 2024
- International Conference on Machine Learning (ICML) 2021, 2022, 2023
- AAAI Conference on Artificial Intelligence (AAAI) 2020, 2021, 2022, 2023
- SIGKDD Conference on Knowledge Discovery and Data Mining (KDD) 2020-2023
- Association for Computational Linguistics (ACL) Rolling Review 2022
- North American Chapter of the Association for Computational Linguistics (NAACL) 2021
- Conference on Empirical Methods in Natural Language Processing (EMNLP) 2020, 2021
- International Conference on Computational Linguistics (COLING) 2022
- Learning on Graphs Conference (LoG) 2022
- International Joint Conferences on Artificial Intelligence (IJCAI) 2020, 2022
- ACM International Conference on Web Search and Data Mining (WSDM) 2022
- SIAM International Conference on Data Mining (SDM) 2022
- European Chapter of the Association for Computational Linguistics (EACL) 2021
- Conference on Information and Knowledge Management (CIKM) 2020, 2021, 2022
- Asia-Pacific Chapter of the Association for Computational Linguistics & International Joint Conference on Natural Language Processing (AACL-IJCNLP) 2020
- International Joint Conference on Neural Networks (IJCNN) 2018, 2019, 2020, 2021

Journal Reviewer
- IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)
- IEEE Transactions on Neural Networks and Learning Systems (TNNLS)
- IEEE Transactions on Knowledge and Data Engineering (TKDE)
- IEEE Transactions on Cybernetics
- Information Fusion
- ACM Transactions on Knowledge Discovery from Data (TKDD)
- Pattern Recognition
- Neural Networks
- ACM Transactions on Asian and Low-Resource Language Information Processing
- IEEE Access
- Neural Computation
- Complexity
- Soft Computing
- Journal of Sports Engineering and Technology
- Complex & Intelligent Systems
- Multimedia Tools and Applications
- Big Data

External Conference Reviewer

- AAAI'18-20, ACM CIKM'18-19, Big Data'18, ICDM'18-19, IJCNN'16-17, ITQM'16-17, KDD'18-21, SDM'18-22, TheWebConf (WWW)'20-22, WSDM'20-21

Conference Volunteer

- The Annual Conference of NAACL-HLT, 2021
- Backuping SDM Session Chairs, 2021
- The 35th AAAI Conference on Artificial Intelligence, 2021
- The 26th SIGKDD Conference on Knowledge Discovery and Data Mining, 2020

PATENTS

- Spatio Temporal Gated Recurrent Unit
  W. Cheng, H. Chen, and **D. Xu**
  U.S. Patent. 11,461,619. Oct. 2022
- System and Method for Knowledge-Preserving Neural Network Pruning
  E. Yan, **D. Xu**, and Z. Xiao
  U.S. Patent. 11,200,497. Dec. 2021

PATENT APPLICATIONS

- Information-aware Graph Contrastive Learning
  W. Cheng, **D. Xu**, and H. Chen
  U.S. Patent App. 17/728,071. Dec. 2022
- Neural Network Pruning Method and System via Layerwise Analysis
  E. Yan, **D. Xu**, and J. Liu
  U.S. Patent App. 17/107,046. Jun. 2022
- Bank-balanced-sparse Activation Feature Maps for Neural Network Models
  E. Yan, **D. Xu**, and J. Liu
  U.S. Patent App. 17/038,557. Mar. 2022
- Tensorized LSTM with Adaptive Shared Memory for Learning Trends
  W. Cheng, H. Chen, J. Ni, **D. Xu**, and W. Yu
  U.S. Patent App. 16/987,789. Mar. 2021
- Modular Networks with Dynamic Routing for Multi-task Recurrent Modules
  W. Cheng, H. Chen, J. Ni, and **D. Xu**
  U.S. Patent App. 17/158,483. July. 2021
- Unsupervised Multivariate Time Series Trend Detection for Group Behavior Analysis
  W. Cheng, H. Chen, J. Ni, **D. Xu**, and W. Yu
  U.S. Patent App. 16/987,734. Mar. 2021
- Adaptive Neural Networks for Node Classification in Dynamic Networks
  W. Cheng, H. Chen, W. Yu, and **D. Xu**
  U.S. Patent App. 16/872,546. Nov. 2020
- Automated Anomaly Precursor Detection
  W. Cheng, **D. Xu**, H. Chen, and M. Natsumeda
  U.S. Patent App. 16/520,632. Feb. 2020

PROFESSIONAL TALKS

- Building Scalable and Efficient Agentic AI Systems
  SAS Institute, Cary, NC, USA, April. 2025
- Building Scalable and Efficient Agentic AI Systems
  NCSU MSE Department, Raleigh, NC, USA, April. 2025
- Advancing Real-World Edge Intelligence
  ABB Corporate Research, Raleigh, NC, USA, Jan. 2025

- Agentic LLM-Powered Diagnostic Chatbot for SAP Manufacturing
  ABB Corporate Research, Raleigh, NC, USA, Sep. 2024
- The Impact of AI on Our Lives and Beyond
  Fo Guang Shan Buddhist Temple, North Carolina, March 2024
- Leveraging Foundation Models for Enhanced Geospatial Analytics and Conservation
  Forest Carbon Solutions Initiative (FCSI), NC State, March 2024
- How LLMs Work and Cutting-Edge Research on Generative AI
  STARS AI Scholars Program, Dec 2023 [remote]
- Sculpting the Future of Collective Growth in Collaborative AI
  Microsoft Research Asia, Beijing, China, Sep 2023 [remote]
- ChatGPT in Corporate Real Estate - Unlocking the Potential [link]
  CoreNet Global, Raleigh, NC, USA, Aug 2023
- Testing Accuracy is Not All You Need: Less Training Cost & More Testing Reliability
  Rutgers University, New Brunswick, USA, Feb 2023
- Resource-efficient Deep Learning: Democratizing AI at Scale
  Pinterest, San Francisco, USA, Aug 2022
- Resource-efficient Deep Learning: Democratizing AI at Scale
  Amazon Search (A9), USA, May 2022
- Resource-efficient Deep Learning: Democratizing AI at Scale
  Vanderbilt University, Nashville, USA, April 2023
- Resource-efficient Deep Learning: Democratizing AI at Scale
  University of Connecticut, Stamford, USA, April 2023
- Parameter Efficiency: Democratizing AI at Scale [Slides]
  Brandeis University, Waltham, USA, Dec 2021
- Chasing Efficiency of Pre-trained Language Models
  Microsoft Research Lab, Redmond, Washington, USA, Jun 2021
- BERT Pruning: Structural vs. Sparse [Slides]
  Brandeis University, Waltham, USA, Apr 2021
- BERT, Compression, and Applications [Slides]
  Xpeng Motors, Mountain View, USA, Apr 2021
- BERT Architecture and Computation Analysis
  Moffett.AI, Los Altos, USA, May 2020.
- Anomaly Precursor Detection via Multi-Instance Contrastive Learning
  NEC Laboratories America, Princeton, USA, May 2019
- Efficient Multiple Instance Learning [Slides]
  NEC Laboratories America, Princeton, USA, May 2018

HONORS AND AWARDS

North Carolina State University

- AAAI Best Demonstration Award 2025
- AAAI New Faculty Highlights 2025
- Best Poster Award at AAAI Spring Symposium on GenAI@Edge 2025
- NVIDIA Academic Grant Program Award 2025
- Microsoft Accelerating Foundation Models Research Award 2024
- NCSU Carla Savage Award 2024

- Best Paper Award Runner-Up at IEEE IPCCC 2024
- ICCCN Best Paper Award 2023

The Pennsylvania State University

- College of IST Award for Excellence in Teaching Support (top 2) 2019
- Third Place Winner (Eng.) in The 37rd Annual PSU Graduate Exhibition 2022
- NAACL Scholarship 2021
- SIAM Student Travel Award 2021
- KDD Student Registration Award 2020
- AAAI Student Scholarship 2020
- IST Travel Award 2019-2021

University of Chinese Academy of Sciences

- Chinese Academy of Sciences President's Fellowship (the most prestigious award) 2016
- National Graduate Scholarship, China (2% in university) 2016
- Graduate Student Academic Scholarship 2015-2017

Renmin University of China

- First-class Scholarship of Sashixuan Elite Fund, China (5% in university) 2014
- Kwang-hua Scholarship of RUC, China 2014
- Second-class Scholarship of Excellent Student Cadre 2014
- Meritorious Winner in Mathematical Contest in Modeling, USA 2013
- First-class Scholarship of Social Work and Volunteer Service of RUC 2013

EXTRACURRICULAR ACTIVITIES

- IEEE Membership 2023-Present
- ACM Membership 2021-Present
- ACL Membership 2021-Present
- AAAI Student Membership 2019-2021
- Volunteer of Beijing Volunteer Service Federation 2012-2014
- President of Youth Volunteers Association of School of Information 2012-2013
- Leader of National Undergraduate Training Programs 2011-2012