## Cong Shen


**Contact**

University of Virginia
351 McCormick Road
Charlottesville, VA 22904
Phone: (434) 924-8940
E-mail: cong@virginia.edu
Web: https://cshen317.github.io/


**Research Interests**

My research interests span a number of interdisciplinary topics in machine learning (ML), artificial intelligence (AI), and networking, with an emphasis on theoretical models, algorithms, and practical engineering applications. Some of my current research topics are:

- **In-context learning, Transformers, and LLMs**
- **Reinforcement learning, multi-armed bandits**
- **Distributed optimization**
- **Federated learning and distributed/decentralized learning**
- **Machine learning on the edge**
- **ML and AI for applications in wireless networking**

**Education**

University of California Los Angeles (UCLA), Los Angeles, U.S.A. 2009
Ph.D., Electrical and Computer Engineering

Tsinghua University, Beijing, China 2004
M. E., Electronic Engineering

Tsinghua University, Beijing, China 2002
B. E., Electronic Engineering

**Work Experience**

**Academia:**

University of Virginia (UVA), Charlottesville, VA, U.S.A. 2024 – now
Associate Professor, Electrical and Computer Engineering

University of Virginia (UVA), Charlottesville, VA, U.S.A. 2019 – 2024
Assistant Professor, Electrical and Computer Engineering

University of Science and Technology of China, Hefei, China 2015 – 2019
Professor, School of Information Science and Technology

**Industry:**

Xsense.ai, San Diego, CA, U.S.A. 2019
Principle Engineer, Autonomous Driving

Silvus Technologies Inc., San Diego, CA, U.S.A. 2017
Consultant

SpiderCloud Wireless Inc., San Jose, CA, U.S.A. 2014 – 2015
Senior Staff Engineer, Corporate Research

Qualcomm Technologies, San Diego, CA, U.S.A. 2010 – 2014
Staff Engineer, Corporate Research and Development
Senior Engineer, Corporate Research and Development

**Awards and Honors**

- *Best Paper of 2024*, Science Robotics, Jan. 2025
- *Best Student Paper Finalist*, Asilomar Conference on Signals, Systems, and Computers, Oct. 2024
- *CAREER Award*, National Science Foundation (NSF), 2022
- *Faculty Research Award*, UVA ECE Department, 2022
- *Best Paper Award*, IEEE International Conference on Communications (ICC), 2021
- *Air Force Research Lab (AFRL) Summer Faculty Fellowship*, 2020, 2021
- *Exemplary Editor*, IEEE Wireless Communications Letters, 2019
- *Excellent Paper Award*, The Ninth International Conference on Ubiquitous and Future Networks (ICUFN 2017)
- *Qualstar*, Qualcomm Research, 2010, 2011, 2013 and 2014

**Top AI/ML Conference Papers**

Note: Underlined co-authors are my supervised students.

[C1] R. Huang, D. Li, C. Shi, **C. Shen**, and J. Yang, "Augmenting Online RL with Offline Data is All You Need: A Unified Hybrid RL Algorithm Design and Analysis," *The 41st Conference on Uncertainty in Artificial Intelligence (UAI)*, July 2025.

[C2] Z. Chen, S. Wang, Z. Tan, J. Li, and **C. Shen**, "MAPLE: Many-Shot Adaptive Pseudo-Labeling In-Context Learning," *The 42nd International Conference on Machine Learning (ICML)*, July 2025.

[C3] W. Shen, R. Zhou, J. Yang, and **C. Shen**, "On the Training Convergence of Transformers for In-Context Classification of Gaussian Mixtures," *The 42nd International Conference on Machine Learning (ICML)*, July 2025.

[C4] D. Wu, C. Shi, R. Zhou, and **C. Shen**, "Cost-Aware Optimal Pairwise Pure Exploration," *The 28th International Conference on Artificial Intelligence and Statistics (AISTATS)*, May 2025.

[C5] R. Liu, D. Li, P. Wang, **C. Shen**, and J. Yang, "A Shared Low-Rank Adaptation Approach to Personalized RLHF," *The 28th International Conference on Artificial Intelligence and Statistics (AISTATS)*, May 2025.

[C6] F. Gao, R. Zhou, T. Wang, **C. Shen**, and J. Yang, "Data-adaptive Differentially Private Prompt Synthesis for In-Context Learning," *The Thirteenth International Conference on Learning Representations (ICLR)*, April 2025.

[C7] R. Liu, R. Zhou, **C. Shen**, and J. Yang, "On the Learn-to-Optimize Capabilities of Transformers in In-Context Sparse Recovery," *The Thirteenth International Conference on Learning Representations (ICLR)*, April 2025.

[C8] C. Shi, K. Yang, J. Yang, and **C. Shen**, "Transformers as Game Players: Provable In-context Game-playing Capabilities of Pre-trained Models," *Thirty-eighth Annual Conference on Neural Information Processing Systems (NeurIPS)*, Dec. 2024.

[C9] C. Shi, K. Yang, Z. Chen, J. Li, J. Yang, and **C. Shen**, "Efficient Prompt Optimization Through the Lens of Best Arm Identification," *Thirty-eighth Annual Conference on Neural Information Processing Systems (NeurIPS)*, Dec. 2024.

[C10] S. Wang, Z. Chen, C. Shi, **C. Shen**, and J. Li, "Mixture of Demonstrations for In-Context Learning," *Thirty-eighth Annual Conference on Neural Information Processing Systems (NeurIPS)*, Dec. 2024.

[C11] C. Shi, R. Zhou, K. Yang, and **C. Shen**, "Harnessing the Power of Federated Learning in Federated Contextual Bandits," *Transactions on Machine Learning Research*, July 2024.

[C12] Z. Chen, S. Wang, **C. Shen**, and J. Li, "FastGAS: Fast Graph-based Annotation Selection for In-Context Learning," *ACL 2024 Findings*, Aug. 2024.

[C13] B. Zhang, Z. Chen, **C. Shen**, and J. Li, "Verification of Machine Unlearning is Fragile," *International Conference on Machine Learning (ICML)*, July 2024.

[C14] R. Liu, **C. Shen**, and J. Yang, "Federated Representation Learning in the Under-Parameterized Regime," *International Conference on Machine Learning (ICML)*, July 2024.

[C15] W. Shen, M. Huang, J. Zhang, and **C. Shen**, "Stochastic Smoothed Gradient Descent Ascent for Federated Minimax Optimization," *International Conference on Artificial Intelligence and Statistics (AISTATS)*, May 2024.

[C16] L. Fan, R. Zhou, C. Tian, and **C. Shen**, "Federated Linear Bandits with Finite Adversarial Actions," *Thirty-seventh Conference on Neural Information Processing Systems (NeurIPS)*, Dec. 2023.

[C17] C. Shi, W. Xiong, **C. Shen**, and J. Yang, "Provably Efficient Offline Reinforcement Learning with Perturbed Data Sources," *the 40th International Conference on Machine Learning (ICML)*, July 2023.

[C18] D. Li, R. Huang, **C. Shen**, and J. Yang, "Near-optimal Conservative Exploration in Reinforcement Learning under Episode-wise Constraints," *the 40th International Conference on Machine Learning (ICML)*, July 2023.

[C19] W. Xiong, H. Zhong, C. Shi, **C. Shen**, L. Wang, and T. Zhang, "Nearly Minimax Optimal Offline Reinforcement Learning with Linear Function Approximation: Single-Agent MDP and Markov Game," *the 11th International Conference on Learning Representations (ICLR)*, May 2023.

[C20] W. Xiong, H. Zhong, C. Shi, **C. Shen**, and T. Zhang, "A Self-Play Posterior Sampling Algorithm for Zero-Sum Markov Games,", *the 39th International Conference on Machine Learning (ICML)*, July 2022.

[C21] C. Shi, H. Xu, W. Xiong, and **C. Shen**, "(Almost) Free Incentivized Exploration from Decentralized Learning Agents," *Thirty-fifth Conference on Neural Information Processing Systems (NeurIPS)*, Dec. 2021.

[C22] C. Shi, W. Xiong, **C. Shen**, and J. Yang, "Heterogeneous Multi-player Multi-armed Bandits: Closing the Gap and Generalization," *Thirty-fifth Conference on Neural Information Processing Systems (NeurIPS)*, Dec. 2021.

[C23] R. Huang, W. Wu, J. Yang, and **C. Shen**, "Federated Linear Contextual Bandits," *Thirty-fifth Conference on Neural Information Processing Systems (NeurIPS)*, Dec. 2021.

[C24] H. Lee, **C. Shen**, W. Zame, J. Lee, and M. van der Schaar, "SDF-Bayes: Cautious Optimism in Safe Dose-Finding Clinical Trials with Drug Combinations and Heterogeneous Patient Groups," *the 24rd International Conference on Artificial Intelligence and Statistics (AISTATS)*, Apr. 2021.

[C25] C. Shi, **C. Shen**, and J. Yang, "Federated Multi-Armed Bandits with Personalization," *the 24th International Conference on Artificial Intelligence and Statistics (AISTATS)*, Apr. 2021. (Oral Presentation Acceptance Rate: 3%)

[C26] C. Shi and **C. Shen**, "Federated Multi-Armed Bandits," *the 35th AAAI Conference on Artificial Intelligence (AAAI)*, Feb. 2021.

[C27] H.-S. Lee, Y. Zhang, W. Zame, **C. Shen**, J.-W. Lee, and M. van der Schaar, "Robust Recursive Partitioning for Heterogeneous Treatment Effects with Uncertainty Quantification," *the Thirty-fourth Conference on Neural Information Processing Systems (NeurIPS)*, Dec. 2020.

[C28] **C. Shen**, Z. Wang, S. Villa, and M. van der Schaar, "Learning for Dose Allocation in Adaptive Clinical Trials with Safety Constraints," *International Conference on Machine Learning (ICML)*, July 2020.

[C29] H. Lee, **C. Shen**, J. Jordon, and M. van der Schaar, "Contextual Constrained Learning for Dose-Finding Clinical Trials," *The 23rd International Conference on Artificial Intelligence and Statistics (AISTATS)*, Palermo, Sicily, Italy, June 2020.

[C30] C. Shi, W. Xiong, **C. Shen**, and J. Yang,"Decentralized Multi-player Multi-armed Bandits with No Collision Information," *The 23rd International Conference on Artificial Intelligence and Statistics (AISTATS)*, Palermo, Sicily, Italy, June 2020.

[C31] W. Wu, J. Yang, and **C. Shen**, "Stochastic Linear Contextual Bandits with Diverse Contexts," *The 23rd International Conference on Artificial Intelligence and Statistics (AISTATS)*, Palermo, Sicily, Italy, June 2020.

[C32] R. Zhou, C. Gan, J. Yang, and **C. Shen**, "Cost-aware Cascading Bandits," *The 27th International Joint Conference on Artificial Intelligence (IJCAI)*, Stockholm, Sweden, Jul. 2018.

[C33] Z. Wang, R. Zhou, and **C. Shen**, "Regional Multi-Armed Bandits," *The 21st International Conference on Artificial Intelligence and Statistics (AISTATS)*, Lanzarote, Spain, Apr. 2018.

**Other AI/ML Conference Papers**

[C31] Z. Chen, J. Li, and **C. Shen**, "Personalized Federated Learning with Attention-based Client Selection," *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Apr. 2024

[C32] R. Liu, J. Yang, and **C. Shen**, "Exploiting Feature Heterogeneity for Improved Generalization in Federated Multi-Task Learning", *IEEE International Symposium on Information Theory (ISIT)*, June 2023.

[C33] C. Shi, **C. Shen**, and N. D. Sidiropoulos, "On High-Dimensional and Low-Rank Tensor Bandits," *IEEE International Symposium on Information Theory (ISIT)*, June 2023.

[C34] C. Shi, W. Xiong, **C. Shen**, and J. Yang, "Reward Teaching for Federated Multi-Armed Bandits," *IEEE International Symposium on Information Theory (ISIT)*, June 2023.

[C35] K. Yang, C. Shi, and **C. Shen**, "Teaching Reinforcement Learning Agents via Reinforcement Learning," *57th Annual Conference on Information Sciences and Systems (CISS)*, March 2023. ***(Invited Paper)***

[C36] Z. Shao, J. Yang, **C. Shen** and S. Ren, "Learning for Robust Combinatorial Optimization: Algorithm and Application," IEEE Conference on Computer Communications (INFOCOM), May 2022.

[C37] K. Yang an **C. Shen**, "On the Convergence of Hybrid Federated Learning with Server-Clients Collaborative Training," *56th Annual Conference on Information Sciences and Systems (CISS)*, March 2022. ***(Invited Paper)***

[C38] D. Cheng, R. Huang, **C. Shen**, and J. Yang, "Cascading Bandits With Two-Level Feedback," *IEEE International Symposium on Information Theory (ISIT)*, June 2022.

[C39] C. Shi and **C. Shen**, "An Attackability Perspective on No-Sensing Adversarial Multi-player Multi-armed Bandits," *IEEE International Symposium on Information Theory*, July 2021.

[C40] C. Gan, J. Yang, R. Zhou, and **C. Shen**, "Online Learning with Diverse User Preferences," *IEEE International Symposium on Information Theory*, Paris, France, July 2019.

[C41] H. Zhang and **C. Shen**, "Best Arm Identification for Both Stochastic and Adversarial Multi-armed Bandits," *IEEE Information Theory Workshop (ITW)*, Guangzhou, China, Nov. 2018. ***(Invited Paper)***

**AI/ML Application Papers**

[C42] Y. Zhang, K. Yang, **C. Shen**, and D. Guo, "Multi-Agent Decision Transformer for Power Control in Wireless Networks," *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, April 2025.

[C43] L. Fan, J. Yang, and **C. Shen**, "Decision Feedback In-Context Symbol Detection over Block-Fading Channels," *IEEE International Conference on Communication (ICC)*, Jun. 2025.

[C44] K. Yang, J. Yang, and **C. Shen**, "Average Reward Reinforcement Learning for Wireless Radio Resource Management," *Asilomar Conference on Signals, Systems, and Computers*, Oct. 2024. ***(Finalist for the Best Student Paper Award)***

[C45] K. Yang, S. Yeh, M. Zhang, J. Sydir, J. Yang, and **C. Shen**, "Advancing RAN Slicing with Offline Reinforcement Learning," *IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN)*, May. 2024.

[C46] Y. Mu, X. Wei, and **C. Shen**, "An Autoencoder-Based Constellation Design for AirComp in Wireless Federated Learning," *IEEE International Conference on Communication (ICC)*, Jun. 2024.

[C47] K. Yang, **C. Shen**, J. Yang, S. Yeh, and J. Sydir, "Offline Reinforcement Learning for Wireless Network Optimization with Mixture Datasets," *the 57th Asilomar Conference on Signals, Systems and Computers*, Oct. 2023. ***(Invited Paper)***

[C48] Y. Mu and **C. Shen**, "Communication and Storage Efficient Federated Split Learning," *IEEE International Conference on Communications (ICC)*, May 2023.

[C49] X. Wei, T. Wang, R. Huang, **C. Shen**, J. Yang, and H. V. Poor, "FLORAS: Differentially Private Wireless Federated Learning Using Orthogonal Sequences," *IEEE International Conference on Communications (ICC)*, May 2023.

[C50] J. Bian, **C. Shen**, and J. Xu, "Federated Learning via Indirect Server-Client Communications," *57th Annual Conference on Information Sciences and Systems (CISS)*, March 2023. ***(Invited Paper)***

[C51] K. Yang, D. Li, **C. Shen**, J. Yang, S. Yeh, and J. Sydir, "Multi-Agent Reinforcement Learning for Wireless User Scheduling: Performance, Scalablility, and Generalization," *the 56th Asilomar Conference on Signals, Systems and Computers*, Oct. 2022. ***(Invited Paper)***

[C52] Y. Mu, **C. Shen**, and Y. C. Eldar, "Optimizing Federated Averaging Over Fading Channels," *IEEE International Symposium on Information Theory (ISIT)*, June 2022.

[C53] **C. Shen**, J. Yang, and J. Xu, "On Federated Learning with Energy Harvesting Clients," *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, May 2022. ***(Invited Paper)***

[C54] X. Wei, **C. Shen**, J. Yang, and H. V. Poor, "Random Orthogonalization for Federated Learning in Massive MIMO Systems," *IEEE International Conference on Communications (ICC)*, May 2022.

[C55] Y. Mu, Y. Tan, M. Veeraraghavan, and **C. Shen**, "A Machine Learning Approach for Rate Prediction in Multicast File-stream Distribution Networks," *IEEE Global Communications Conference (GLOBECOM)*, Dec. 2021.

[C56] X. Wei and **C. Shen**, "Federated Learning over Noisy Channels," *IEEE International Conference on Communications (ICC)*, June 2021.

[C57] S. Zheng, **C. Shen**, and X. Chen, "Design and Analysis of Uplink and Downlink Communications for Federated Learning," *IEEE International Conference on Communications (ICC)*, June 2021. ***(Best Paper Award)***

[C58] **C. Shen** and S. Chen, "Federated Learning with Heterogeneous Quantization," *ACM/IEEE Symposium on Edge Computing – Workshop on Edge Computing and Communications (EdgeComm)*, Nov. 2020.

[C59] **C. Shen**, D. Li, and J. Yang, "MIMO Receive Antenna Selection via Deep Learning and Greedy Adaptation," *the 54th Asilomar Conference on Signals, Systems and Computers*, pp. 403-407, Nov. 2020. ***(Invited Paper)***

[C60] C. Gan, J. Yang, and **C. Shen**, "Thresholded Wirtinger Flow for Fast Millimeter Wave Beam Alignment," *the 54th Asilomar Conference on Signals, Systems and Computers*, pp. 32-36, Nov. 2020. ***(Invited Paper)***

[C61] W. Chen, R. Zhou, C. Tian, and **C. Shen**, "On Top-$k$ Selection from $m$-wise Partial Rankings via Borda Counting," *IEEE International Symposium on Information Theory*, June 2020.

[C62] K. Yang, **C. Shen**, and T. Liu, "Deep Reinforcement Learning based Wireless Network Optimization: A Comparative Study," *IEEE INFOCOM 2020 Workshop on Data Driven Intelligence for Networks*, July 2020.

[C63] C. Shi, L. Chen, **C. Shen**, and J. Xu, "Privacy-Aware Edge Computing Based on Adaptive DNN Partitioning," *IEEE Global Communications Conference (GLOBECOM)*, Hawaii, USA, Dec. 2019.

[C64] C. Wang, R. Zhou, J. Yang, and **C. Shen**, "A Cascading Bandit Approach to Efficient Mobility Management in Ultra-Dense Networks," IEEE International Workshop on Machine Learning for Signal Processing (MLSP), Pittsburgh, PA, USA, Oct. 2019. ***(Invited Paper)***

[C65] F. Liang, **C. Shen**, W. Yu, and F. Wu, "Power Control for Interference Management via Ensembling Deep Neural Networks," *IEEE/CIC ICCC 2019*, Changchun, China, Aug. 2019. ***(Invited Paper)***

[C66] Z. Wang, Z. Ying, and **C. Shen**, "Opportunistic Spectrum Access via Good Arm Identification," *IEEE GlobalSIP*, Anaheim, California, USA, Nov. 2018.

**Tutorials**

[T1] **Cong Shen**, Cem Tekin, and Mihaela van der Schaar, "Online Learning for Wireless Communications: Theory, Algorithms, and Applications," tutorial given at the 2021 IEEE International Conference on Communications (ICC), July 2021.

[T2] **Cong Shen**, "Case Studies of Deep Learning for Channel Decoding and Power Control," IEEE Signal Processing Society Webinar Series, September 14, 2021.

**Invited Presentations**

Sequential Decision-Making for Spectrum Sharing and Management

- U.S.A. FCC TAC AI/ML Working Group – AIWG Nov. 2024

Transforming Demodulation

- EFCL International Workshop on Sustainable AI, ETH Zurich — Nov. 2024

Federated Bandits: From Incentivized Exploration to Reward Teaching

- Amazon, U.S.A. — Jan. 2024

Towards Real-Time Federated Learning over Wireless Communications

- Virginia CCI CVN Speaker Series, U.S.A. — Nov. 2023

The role of random orthogonality in federated learning

- National University of Singapore, Singapore — Jan. 2023
- University at Buffalo, U.S.A. — Oct. 2023

On federated learning over wireless fading channels

- *EE Department Colloquium*, The Pennsylvania State University, U.S.A. — Mar. 2022

Federated multi-armed bandits

- Intel Labs, U.S.A. — Aug. 2021

Flying under the radar: federated learning over noisy channels

- Texas A&M University, U.S.A. — Sept. 2021
- University of Texas Austin, U.S.A. — Nov. 2020
- Tsinghua University, China — May 2021

Cost-aware cascading bandits

- Oxford University, U.K. — Nov. 2017
- ShanghaiTech University, China — Nov. 2017
- University of California, Davis, U.S.A. — Feb. 2018
- City University of Hong Kong, Hong Kong — Jun. 2018
- The Alan-Turing Institute, London, U.K. — Oct. 2018
- National Institute of Informatics, Tokyo, Japan — Nov. 2018

Universal best arm identification

- Qualcomm Inc., San Diego, U.S.A. — Feb. 2018
- The Pennsylvania State University, U.S.A. — Sept. 2018

Regional multi-armed bandits

- Qualcomm Inc., San Diego, U.S.A. — Feb. 2018
- Texas A&M University, U.S.A. — Mar. 2018

An iterative BP-CNN architecture for channel decoding

- University of Texas, Austin, U.S.A. — Mar. 2018
- University at Buffalo, U.S.A. — May 2018
- City University of Hong Kong, Hong Kong — Jun. 2018

**Professional Activities**

**Senior Program Committee and Area Chair for AI and ML Conferences:**

- *Conference on Neural Information Processing Systems (NeurIPS), Area Chair:* 2025
- *International Joint Conference on Artificial Intelligence (IJCAI), Senior Program Committee:* 2021, 2023
- *International Conference on Artificial Intelligence and Statistics (AISTATS), Area Chair:* 2023, 2024, 2025

**Program Committee & Reviewer for AI and ML Conferences:**

- *International Conference on Machine Learning (ICML):* 2022, 2023, 2024, 2025
- *International Conference on Learning Representations (ICLR):* 2022, 2023, 2024
- *Conference on Neural Information Processing Systems (NeurIPS):* 2021, 2022, 2023, 2024
- *International Joint Conference on Artificial Intelligence (IJCAI):* 2020, 2021, 2023, 2025
- *AAAI Conference on Artificial Intelligence (AAAI):* 2019, 2020, 2021

**IEEE Technical Committee Activities:**

- Chair: Special Interest Group on Signal Processing Techniques for Big Data and Wireless Edge Intelligence, IEEE ComSoc SPCC Technical Committee Jan. 2020 – Dec. 2022

**Conference Chair:**

- *Co-organizer:* AAAI 2025 Workshop on Artificial Intelligence for Time Series Analysis (AI4TS): Theory, Algorithms, and Applications
- *Publicity Co-Chair:* WiOpt 2024
- *Workshop Co-Chair:* IEEE ICC 2024 The 3rd Workshop on Spectrum Sharing Technology for Next Generation Communications
- *Publicity Co-Chair:* IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN) 2024
- *TPC Co-Chair:* 1st SIGKDD International Workshop on NL2Code-Reasoning and Planning with LLM for Code Development, 2024
- *Program Co-Chair:* 10th SIGKDD International Workshop on Mining and Learning from Time Series Workshop: From Classical Methods to LLMs, 2024
- *Program Co-Chair:* 9th SIGKDD International Workshop on Mining and Learning from Time Series – Deep Forecasting: Models, Interpretability, and Applications, 2023
- *Program Co-Chair:* 8th SIGKDD International Workshop on Mining and Learning from Time Series – Deep Forecasting: Models, Interpretability, and Applications, 2022
- *Publicity Co-Chair:* WiOpt 2024

**Membership:**

- *Senior Member:* ACM, IEEE, IEEE ComSoc, IT, and SP societies
- *Member:* Sigma Xi

**Research Grants**

1. **PI**, *NTIA*, "AI and ML for Spectrum Management"
2. **PI**, *Juniper Networks*, unrestricted gift
3. **Co-PI**, *UVA Internal Commonwealth Cyber Initiative (CCI) Cybersecurity Research*

*Continuation*, "Smart Cities"

4. **Co-PI**, *UVA Internal FY24 Research Innovation Awards*, "Artificial Insect Eye for Spatiotemporal Perception and Cognition in 3D Space via Edge Computing"
5. **Co-PI**, *UVA Internal CCI Commercialization and Innovation*, "Privacy-preserving Synthetic Data Generation"
6. **Co-PI**, *2024 NoVA Node CCI+A (CATAPULT) Fund*, " Privacy-preserving Synthetic Data Generation"
7. **Co-PI**, *National Science Foundation (NSF) ECCS Core Program*, "Integrating Federated Split Neural Network with Artificial Stereoscopic Compound Eyes for Optical Flow Sensing in 3D Space with Precision"
8. **PI**, *National Science Foundation (NSF) Cyber-Physical Systems Core Program, Medium Project*, "Learning through the Air: Cross-Layer UAV Orchestration for Online Federated Optimization"
9. **PI**, *National Science Foundation (NSF) CAREER Program*, "CAREER: Towards a Communication Foundation for Distributed and Decentralized Machine Learning"
10. **PI**, *National Science Foundation (NSF) SWIFT Program*, "SWIFT: SMALL: Learning-Efficient Spectrum Access for No-Sensing Devices in Shared Spectrum"
11. **PI**, *National Science Foundation (NSF) ECCS Core Program*, "Towards a Resource Rationing Framework for Wireless Federated Learning"
12. **PI**, *National Science Foundation (NSF) and Intel MLWiNS Program*, "MLWiNS: Dino-RL: A Domain Knowledge Enriched Reinforcement Learning Framework for Wireless Network Optimization"
13. **Co-PI**, *Commonwealth Cyber Initiative (CCI) Commercialization Fund*, "Connected Vehicle Identification System and Cybersecurity Assessment Testbed"
14. **Co-PI**, *Commonwealth Cyber Initiative (CCI) CVN Innovation and Commercialization Grant*, "Towards Real-Time Federated Learning over Wireless Communications"
15. **PI**, *Commonwealth Cyber Initiative (CCI) Cybersecurity Research Collaboration Grants*, "Open-source, Multi-band, Multi-dimensional Spectrum Access system with Interfaces to Wireless Testbeds and Network Simulation Software"
16. **Co-PI**, *Commonwealth Cyber Initiative (CCI) Cybersecurity Research Collaboration Grants*, "Secure and Privacy 5G Network for Connected Vehicles"
17. **Co-PI**, *Commonwealth Cyber Initiative (CCI) Cybersecurity Research Collaboration Grants*, "SmallSat Cybersecurity and Resiliency"
18. **Co-PI**, *UVA Internal Commonwealth Cyber Initiative (CCI) Cybersecurity Research Continuation*, "Smart Cities"
19. **PI**, *Kneron Inc.*, "Low-resolution Machine Learning Model Representation in Distributed Learning"
20. **PI**, *Bloomberg L.P.*, unrestricted gift
21. **PI**, *Kneron Inc.*, "Efficient Deep Learning Architecture in Mobile Edge Computing"
22. **PI**, subcontract from *VT-ARC*, "Towards low-latency, energy-efficient and resilient 5G network for smart warehouse"

23. **Senior Personnel**, *National Science Foundation (NSF) Research Traineeship (NRT) Program*, "Secure Emergency Communications", Supplementary funding to "NRT: A Graduate Traineeship in Cyber Physical Systems"
24. **Senior Personnel**, *National Science Foundation (NSF) Spectrum Innovation Initiative (SII) Program*, "SII Planning: WHISPERS: Wireless Hardware Innovations and Signal Processing for Enhanced Radio-astronomy and Scientific Spectrum Sharing"
25. **Senior Personnel**, *National Science Foundation (NSF)*, "SII-Center: SpectrumX – The National Center for Spectrum Innovation"

**Supervised Students**

- Chengshuai Shi (August 2019 – May 2024): PhD. First job: Bloomberg
- Xizixiang Wei (August 2020 – May 2024): PhD. First job: Apple
- Kun Yang (August 2020 – July 2024): PhD. First job: Juniper Networks
- Yujia Mu (August 2020 – now): PhD candidate
- Li Fan (August 2020 – now): PhD candidate
- Wei Shen (August 2022 – now): PhD student
- Zhihan Chen (Jan. 2023 – now): PhD student (co-advised)
- Peng Wang (Aug. 2024 – now): PhD student (co-advised)
- Di Wu (August 2024 – now): PhD student
- Songwei Dong (August 2024 – now): PhD student
- Zihao Liang (August 2024 – now): PhD student
- Zhoubin Kou (Jan. 2025 – now): PhD student

**Students Honors**

- Yujia Mu received the Malathi Veeraraghavan Legacy Fellowship from the Charles L. Brown Department of Electrical and Computer Engineering for 2022
- Xizixiang Wei received the Charles L. Brown Department of Electrical and Computer Engineering's Ann Lee Brown Rookie of the Year (graduate) for 2022
- Chengshuai Shi received the Bloomberg Data Science Ph.D. Fellowship for 2021-2022 and 2022-2023
- Chengshuai Shi received the McVey Fellowship from the Charles L. Brown Department of Electrical and Computer Engineering for 2022 - 2023
- Chengshuai Shi received the 2022-2023 Endowed Graduate Fellowship from the Engineering School at UVa
- Chengshuai Shi received the Charles L. Brown Department of Electrical and Computer Engineering's Louis T Rader Graduate Research Award for 2023
- Xizixiang Wei received the McVey Fellowship from the Charles L. Brown Department of Electrical and Computer Engineering for 2023 - 2024
- Xizixiang Wei received the 2023-2024 Endowed Graduate Fellowship from the Engineering School at UVa
- Kun Yang won the third place award in the Fall 2023 ECE Student Research Poster Session
- Zihan Chen received the Charles L. Brown Department of Electrical and Computer Engineering's Ann Lee Brown Rookie of the Year (graduate) for 2024
- Kun Yang's first-author Asilomar 2024 paper was selected as a finalist for the Best Student Paper Award