LISHAN YANG

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RESEARCH INTERESTS

System reliability, GPU, reliability support for HPC

EDUCATION

Ph.D. in Computer Science June 2022
Department of Computer Science
William & Mary, Williamsburg, VA
- Advisor: Prof. Evgenia Smirni
- Dissertation Title: Practical GPGPU Application Resilience Estimation and Fortification

B.E. in Computer Science June 2016
School of Computer Science and Technology
University of Science and Technology of China (USTC), Hefei, China
- Advisor: Prof. Bei Hua

PUBLICATIONS

My students are highlighted.

Y. Sun, Z. Zhu, C. Mulpuru, R. Gioiosa, Z. Zhang, B. Fang, **L. Yang**, "FT2: First-Token-Inspired Online Fault Tolerance on Critical Layers for Generative Large Language Models", The 34th ACM International Symposium on High-Performance Parallel and Distributed Computing (HPDC 2025), to appear.

C. Chen, G. Xiao, D. Lee, **L. Yang**, E. Smirni, H. Alemzadeh, X. Zhou, "Safety Interventions against Adversarial Patches in an Open-Source Driver Assistance System", the 55th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN 2025), Practical Experience Report, to appear.

L. Yang, G. Papadimitriou, D. Sartzetakis, A. Jog, E. Smirni, D. Gizopoulos, "GPU Reliability Assessment: Insights Across the Abstraction Layers", The IEEE International Conference on Cluster Computing (CLUSTER) 2024. (Acceptance rate: 28.2%, Best Paper Finalist)

A. Schmedding, **L. Yang**, A. Jog and E. Smirni, "Aspis: Lightweight Neural Network Protection Against Soft Errors", The 35th IEEE International Symposium on Software Reliability Engineering (ISSRE) 2024. (Acceptance Rate: 26%)

A. Schmedding, P. Schowitz, X. Zhou, Y. Lu, **L. Yang**, H. Alemzadeh and E. Smirni, "Strategic Resilience Evaluation of Autonomous Vehicle Neural Networks Against Transient Faults", 43rd International Conference on Computer Safety, Reliability and Security (SafeComp) 2024. (Acceptance Rate: 23.5%)

B. Zhang, **L. Yang**, H. Xu, G. Li, "Investigating the Impact of High-Level Software Design on Low-Level Hardware Fault Resilience", 53th IEEE/IFIP International Conference on Dependable Systems and Networks (DSN) 2023, Disrupt 23 track

A. Schmedding, R. Pinciroli, **L. Yang**, E. Smirni, "Epidemic Spread Modeling for COVID-19 Using Cross-fertilization of Mobility Data", IEEE Transactions on Big Data (TBD), 2023.

A. Schmedding, **L. Yang**, R. Pinciroli, E. Smirni, "GeoSpread: an Epidemic Spread Modeling Tool for COVID-19 Using Mobility Data", ACM International Conference on Information Technology for Social Good (GoodIT) 2022: pp. 125-131.

X. Zhou, A. Schmedding, H. Ren, **L. Yang**, P. Schowitz, E. Smirni, H. Alemzadeh, "Strategic Safety-Critical Attacks Against an Advanced Driver Assistance System", 52th IEEE/IFIP International Conference on Dependable Systems and Networks (DSN) 2022: pp. 79-87.

R. Pinciroli, **L. Yang**, J. Alter, E. Smirni, "Lifespan and Failures of SSDs and HDDs: Similarities, Differences, and Prediction Models", IEEE Transactions on Dependable and Secure Computing (TDSC), 2022.

L. Yang, B. Nie, A. Jog, E. Smirni, "Enabling Software Resilience in GPGPU Applications via Partial Thread Protection", IEEE/ACM 43rd International Conference on Software Engineering (ICSE) 2021: pp. 1248-1259. (Acceptance Rate: 22%)

L. Yang, B. Nie, A. Jog, E. Smirni, "SUGAR: Speeding Up GPGPU Application Resilience Estimation with Input Sizing", Proceedings of the ACM on Measurement and Analysis of Computing Systems (Sigmetrics) 2021, no. 1: 1-29. (Acceptance Rate: 12%)

L. Yang, B. Nie, A. Jog, E. Smirni, "Practical Resilience Analysis of GPGPU Applications in the Presence of Single- and Multi-bit Faults", IEEE Transactions on Computers, vol. 70, no. 1, pp. 30-44, 1 Jan. 2021.

B. Nie, **L. Yang**, A. Jog, E. Smirni, "Fault Site Pruning for Practical Reliability Analysis of GPGPU Applications", 51st Annual IEEE/ACM International Symposium on Microarchitecture (MICRO) 2018: pp. 749-761. (Acceptance Rate: 21%)

K. Zhang, B. He, J. Hu, Z. Wang, B. Hua, J. Meng, **L. Yang**, "G-NET: Effective GPU Sharing in NFV Systems", 15th USENIX Symposium on Networked Systems Design and Implementation (NSDI) 2018: pp. 187-200. (Acceptance Rate: 16%)

L. Yang, L. Cherkasova, R. Badgujar, J. Blancaflor, R. Konde, J. Mills, E. Smirni, "Evaluating Scalability and Performance of a Security Management Solution in Large Virtualized Environments", Proceedings of the 2018 ACM/SPEC International Conference on Performance Engineering (ICPE): pp. 168-175.

Refereed Posters

L. Yang, G. Papadimitriou, D. Sartzetakis, A. Jog, E. Smirni, D. Gizopoulos, "Probing Weaknesses in GPU Reliability Assessment: A Cross-Layer Approach", IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS) 2024, Poster track.

L. Yang, "Typhoon: Enabling GPGPU Application Resilience Estimation with Different Input Types", ACM Sigmetrics Student Research Competition (SRC) 2021

L. Yang, A. Schmedding, R. Pinciroli, E. Smirni, "Simulating COVID-19 Containment Measures Using the South Korean Patient Data", Sensys 2020, COVID-19 Pandemic Research Poster Session.

PROFESSIONAL EXPERIENCE

Assistant Professor August 2022 - Present
Department of Computer Science, George Mason University, Fairfax, VA

Research Assistant August 2017 - July 2022
Department of Computer Science, College of William & Mary, Williamsburg, VA

Teaching Assistant August 2016 - May 2018
Department of Computer Science, William & Mary, Williamsburg, VA

Software Engineering Intern May 2021 - August 2021
Facebook Inc, Menlo Park, CA

Reliability Intern June 2019 - October 2019
IBM Corporation, Austin, TX

Software Engineering Intern May 2017 - August 2017
Hytrust Inc, Mountain View, CA

STUDENTS

- Zhu Zhu, Ph.D. student, since 2023 Fall
- Yu Sun, Ph.D. student, since 2023 Fall
- Giuseppe De Rosa, Visiting Ph.D. student from Scuola IMT Alti Studi Lucca, since 2025 Spring
- Daehyun Lee, MS student, since 2024 Fall
- Sam O'Neill, George Mason University, since 2025 Spring (Undergrad)
- Dhatri Parakal (Undergrad from UIUC, since 2024 Spring, recruited and sponsored by ASSIP)
- Cherish Mulpuru, 2024 Fall - 2025 Spring (Undergrad, supported by CCI NoVA-node URA program)
- Jagan Yetukuri, since 2024 Fall (Undergrad)
- Sofia Francisco Skamnelos (High school student from Holton-Arms School, since Nov 2024, through an initiative of "Directed Reading" program with Holton-Arms School)
- Grace Xiao (High school student from Holton-Arms School, since Nov 2024, through an initiative of "Directed Reading" program with Holton-Arms School)
- Lucia M. Noto (High school student from Holton-Arms School, since 2024 Summer, through an initiative of "Directed Reading" program with Holton-Arms School)
- Weilon Price, 2022-2023 (Undergrad)

RESEARCH FUNDING

- NSF (National Science Foundation) #CCF-2402940, 2024-2027
  Collaborative Research: SHF: Medium: End-to-End Resilience in Autonomous Driving Systems: Strategic Vulnerability Assessment and Mitigation
  Role: lead-PI. Total: $927,747, my share: $338,546. With Dr. Homa Alemzadeh (University of Virginia) and Dr. Evgenia Smirni (William & Mary)
- NSF (National Science Foundation) #OAC-2417718, 2024-2028
  Collaborative Research: CyberTraining: Implementation: Medium: AI4EDU: Cloud Infrastructure-Enabled Training for AI in Educational Research and Assessment

Role: PI. Total: $999,969, my share: $184,360. With Dr. Ningfang Mi (lead-PI, Northeastern University), Yu Wang (Temple University), Chiu C. Tan (Temple University), Chuang Wang (University of North Carolina at Charlotte)

- NSF (National Science Foundation) #OAC-2410856, 2024-2027
  Collaborative Research: Elements: MELIOREM: An Integrated Evaluation Cyberinfrastructure towards Safe and Dependable Autonomous Driving Systems
  Role: PI. Total: $589,751, my share: $279,674. With Dr. Guanpeng Li (lead-PI, University of Iowa)
- Commonwealth Cyber Initiative (CCI), #HC-3Q24-047, Research in Supply Chain Cybersecurity, 2024.
  Securing the Machine Learning Components of Autonomous Systems: Risk Assessment and Mitigation
  Role: co-PI. Total: $100K, my share: $50K. With Dr. Evgenia Smirni (lead-PI, William & Mary)
- George Mason University startup fund.

TEACHING

- CS692 Special Topics: Advanced Computer Architecture, 2025 Spring
- CS692 Special Topics: Reliability in Computer Systems, 2024 Fall
- CS692 Special Topics: Advanced Computer Architecture, 2024 Spring
- CS475 Concurrent & Distributed Systems, 2023 Fall
- CS695 Special Topics: Advanced Computer Architecture, 2023 Spring
- CS475 Concurrent & Distributed Systems, 2022 Fall

AWARDS

- Outstanding Teaching Award (Tenure-Line), CS@GMU, 2025
- Best Paper Finalist, CLUSTER 2024
- Best Reviewer Award, ICPE 2024
- SPEC Kaivalya Dixit Distinguished Dissertation Award, 2022
- W&M CS Graduate Park Award, 2022
- Student Travel Grant for DSN, 2022
- W&M International Student Opportunity Scholarship , 2021
- vGHC Students and Faculty Scholarship, 2021
- Student Travel Grant for MICRO, ICPE, and NSDI, 2018
- W&M OGSR Research Grant, 2018
- W&M Student Leadership Grant, 2018
- W&M CS Student Travel Grant, 2018
- Active Member in Social Practice, USTC, 2015
- Excellent Student Cadre, USTC, 2014
- Outstanding League Member, USTC, 2013
- Tenth Yang Ya Scholarship, USTC, 2013
- Second Prize in Essay Competition, USTC, 2013

SERVICE

- Program Committees: DSN 2026, Sigmetrics 2026, DSN 2025, Sigmetrics 2025, PPoPP 2025, ICPE 2025, SRDS 2025, ICDCS 2025, DT4DRS 2025, FSE SRC 2025, SC SRC 2025, Sigemtrics 2024, DSN 2024, ICPE 2024, CLUSTER 2024, SAC 2024, CCGrid 2024 Doctoral Symposium and Early Career Track, DSN 2023, SC2023, IPDPS 2023, HPDC 2023, SRDS 2023, AIPerf 2023, LADC Student Forum 2023, ESANN Special Session 2023
- Organizing Committees: Sigmetrics 2026 (Student Activities Chair), Sigmetrics 2025 (SRC Chair), ICPE 2025 (Industry Chair), DSN 2025 (Artifact Chair), Sigemtrics 2024 (SRC Chair), DSN 2024 (Posters Track Chair), HPDC 2024 (Social Media Chair), ICPE 2024 (Vision and WiP Track Chair), Sigmetrics 2023 (Publicity Chair), HPDC 2023 (Social Media Chair), HotStorage 2023 (Virtual Conference Chair), DSML 2023 (General and PC Chair)
- Journal Reviewing: IEEE TC (Transactions on Computers), ACM TOMPECS (Transactions on Modeling and Performance Evaluation of Computing Systems), IEEE TDSC (Transactions on Dependable and Secure Computing), IEEE TCC (Transactions on Cloud Computing), IEEE Transactions on Reliability, IEEE/ACM Transactions on Networking (ToC)
- Faculty Advisor of GMU CS-GSA (Graduate Student Association) since 2023 Fall
- Steering Committee: Dependable and Secure Machine Learning (DSML workshop) since 2023
- Session Chair & Poster Judge: ACM Capital Region Celebration of Women in Computing (CAPWIC) 2021 and 2022
- Panelist: W&M Symposium for Graduate Studies 2022
- Sub-reviewer of ICCPS 2025, Sigmetrics 2022, DSN 2022, DSN 2021, Sigmetrics 2021, Sigmetrics 2020, Performance 2020, ICPE 2020, Sigmetrics 2019, DSN 2019
- Member of WHPC-Virginia (Women in High Performance Computing in Virginia) since 2021, SWC-WM (Society of Women in Computing in William & Mary) 2017-2022
- Volunteer: HPDC 2019 Program Committee Meeting
- Mentor: SC Mentor-Protégé Program 2023/2024, HackViolet 2022, AnitaB.org Mentorship Program 2022, W&M GSA DEI Mentoring Program 2021-2022