

Yihan Pang

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RESEARCH INTERESTS

- Systems for Spatial Computing and Embodied AI • Scalable Infrastructure
- Algorithm–System Co-design • Distributed Systems

EDUCATION

Ph.D. Computer Science; 2020 – 05/2027 (Anticipated)
University of Illinois at Urbana-Champaign, Champaign, IL
Advisor: Sarita Adve

M.S. Computer Engineering; 2016 – 2019
Virginia Polytechnic Institute and State University, Blacksburg, VA
Advisor: Binoy Ravindran
Thesis: *Leveraging Processor-diversity for Improved Performance in Heterogeneous-ISA Systems*

B.S. Computer Engineering; Minor: Math, Cybersecurity 2011 – 2015
Virginia Polytechnic Institute and State University, Blacksburg, VA

SKILLS

Programming Languages: C/C++, Python, Bash
ML & GPU Computing: PyTorch, CUDA, NVIDIA Warp, Nsight Compute
Systems & Tools: ILLIXR, GStreamer/FFmpeg, LLVM

PUBLICATIONS

A Wearable Platform for Augmented Reality Systems Research
Manuscript under review.

Task-Aware Real-Time Depth Estimation for XR Systems
Manuscript under review.

Boba: Batched Simulation for Physics-Based Gaussian Digital Twins
Y. Pang, H. Jiang, S. Kondguli, S. Adve, S. Wang
In Proceedings of the European Conference on Computer Vision (ECCV 2026).

Ada: A Distributed, Power-Aware, Real-Time Scene Provider for XR
Y. Pang, S. Kondguli, S. Wang, S. Adve
IEEE Transactions on Visualization and Computer Graphics (TVCG), ISMAR 2025 Special Issue. Also in Proceedings of the 24th IEEE International Symposium on Mixed and Augmented Reality (ISMAR 2025).
Best Paper Award, ISMAR 2025.

MLCD: Machine Learning-based Code Version and Device Selection for Heterogeneous Systems
K. Cao, H. Ye, **Y. Pang**, D. Chen
IEEE Transactions on Computers (TC), 2025.

RemoteVIO: Towards a Practical End-to-End VR System with Head Tracking Offloading
Q. Jiang, **Y. Pang**, W. Sentosa, S. Gao, H. Muhammad, J. Zhang, J. Perez-Ramirez, D. Das, D. Cavalcanti, B. Godfrey, S. Adve
In Proceedings of the 16th ACM Multimedia Systems Conference (MMSys'25).

Towards Energy-Efficiency by Navigating the Trilemma of Energy, Latency, and Accuracy

B. Tian, **Y. Pang**, H. Muhammad, S. Wang, S. Adve

In Proceedings of the 23rd IEEE International Symposium on Mixed and Augmented Reality (ISMAR 2024).

AdaptiveFusion: Low-Power Scene Reconstruction

H. Muhammad, B. Tian, **Y. Pang**, H. Che, S. Wang, S. Adve

In Proceedings of the IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW 2023).

Offloading Visual-Inertial Odometry for Low-Power Extended Reality

Q. Jiang, H. Muhammad, W. Sentosa, J. Zhang, S. Gao, **Y. Pang**, H. Che, B. Godfrey, S. Adve

In Proceedings of the IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW 2023).

ILLIXR: Enabling End-to-End Extended Reality Research

H. Muhammad, R. Desai, S. Grayson, X. Jiang, Y. Jiang, Y. Jing, J. Lee, F. Lu, **Y. Pang**, J. Ravichandran, F. Sinclair, B. Tian, H. Yuan, J. Zhang, S. Adve

In Proceedings of the 2021 IEEE International Symposium on Workload Characterization (IISWC), 2021.

Best Paper Award; IEEE Micro Top Pick.

Quantifying Memory Underutilization in HPC Systems and Using It to Improve Performance via Architecture Support

G. Panwar*, D. Zhang*, **Y. Pang***, M. Dahshan, N. DeBardeleben, B. Ravindran, X. Jian

In Proceedings of the 52nd IEEE/ACM International Symposium on Microarchitecture (MICRO-52).

*First co-authors.

Cross-ISA Execution of SIMD Regions for Improved Performance

Y. Pang, R. Lyster, B. Ravindran

In Proceedings of the 12th ACM International Conference on Systems and Storage (SYSTOR 2019).

RESEARCH EXPERIENCES

PhD Intern

NVIDIA

May 2026 – Aug. 2026

Santa Clara, CA

- Re-engineered and scaled ML training and data infrastructure for NVIDIA's XR team, spanning large-scale synthetic data generation, preprocessing, storage/loading, sampling, and targeted data curation for 3D hand reconstruction; the resulting infrastructure serves as the training and data backbone for the team's latest hand models
- Improved the scalability and efficiency of real and synthetic data pipelines, achieving $1.6\times$ faster generation and $2.6\times$ faster preprocessing, saving $\sim 20K$ A100 GPU-hours within a few days of large-scale generation while substantially reducing filesystem and memory pressure
- Developed data-quality and targeted-curation tooling to improve useful data diversity and coverage and turn observed model failure cases into reusable synthetic training data

Research Assistant

University of Illinois at Urbana-Champaign

Supervised by Prof. S. Adve

Collaboration with Meta Reality Lab (since 2024)

2020 – Present

Champaign, IL

- Design energy-efficient XR systems for real-time spatial computing workloads
- Developed Ada, a distributed, power-aware real-time scene provisioning system for XR that offloads scene reconstruction and extraction, reducing device-side incremental power by 24% while maintaining

comparable latency and scene fidelity

- Developed Boba, a scalable system for physics-based Gaussian digital twins, achieving over $10\times$ single-instance speedup, 3,310 FPS aggregate batched throughput, and 22.2% lower edge-device incremental power through distributed execution
- Collaborate on XR systems spanning visual-inertial odometry, scene reconstruction, and task-aware real-time depth estimation, targeting device power, latency, and quality constraints
- Integrate research systems into the open-source Illinois Extended Reality Testbed (ILLIXR) to support reproducible, end-to-end XR systems research

Research Assistant

2018 – 2019

Supervised by Prof. X. Jian and Prof. B. Ravindran

Blacksburg, VA

- Quantified memory underutilization in HPC systems using real workloads
- Designed and implemented architectural and OS support to improve performance through better memory utilization

Research Assistant

2016 – 2019

Supervised by Prof. B. Ravindran

Blacksburg, VA

- Studied performance opportunities in heterogeneous systems with diverse processor and ISA designs
- Designed SIMD-extension migration support across ISAs, including LLVM compiler passes and Linux kernel changes for ISA-diverse multi-core systems
- Enhanced LLVM profile-guided optimizations to account for ISA-diverse multi-core architectures
- Developed a scheduler that exploits processor affinity by enabling runtime migration of applications across ISA-diverse cores, improving performance on heterogeneous platforms

HONORS & AWARDS

Full Tuition Scholarship, Virginia Tech

2016-2019

Dean's List, Virginia Tech

2011-2015