Yihan Pang

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RESEARCH INTERESTS

• Systems for Extended Reality • Spatial Computing • Hardware–Software Co-design • Distributed Systems

EDUCATION

Ph.D. Computer Science; 2020 – Present
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
GPU & Parallel Computing: CUDA, NVIDIA Warp
Systems & Frameworks: ILLIXR, GStreamer/FFmpeg, PyTorch, LLVM

PUBLICATIONS

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), July 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), March 2025.

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), October 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), March 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), March 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), October 2019. *First co-authors.

Cross-ISA Execution of SIMD Regions for Improved Performance
Y. Pang, R. Lyerly, B. Ravindran
In Proceedings of the 12th ACM International Conference on Systems and Storage (SYSTOR 2019), June 2019.

RESEARCH EXPERIENCES

Research Assistant 2020 – Present
University of Illinois at Urbana–Champaign — Champaign, IL
Supervised by Prof. S. Adve —
Collaboration with Meta Reality Lab (since 2024)

- Design energy-efficient XR systems that support spatial computing tasks
- Designed and evaluated a distributed, power-aware scene provider that offloads scene reconstruction and mesh delivery while meeting real-time latency and quality targets under tight power budgets
- Currently developing real-time physical simulation pipelines for neural-representation-based digital twins, including optimization for both single-instance and batched simulation
- Collaborate on other XR workloads, including efficient visual–inertial odometry and scene reconstruction, to reduce device power use without degrading user experience
- Integrate these designs into the open-source Illinois Extended Reality Testbed (ILLIXR) to support reproducible and extensible 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