

Yizhou Shan

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RESEARCH INTERESTS

My research interests span Distributed System, Operating System, and Computer Architecture, with a focus on building fast and reliable systems for datacenters. I work at Wuklab, UCSD, under the supervision of Prof. Yiyang Zhang.

EDUCATION

University of California San Diego Ph.D. in Computer Science and Engineering	2019-2021 (expected)
Purdue University Ph.D. in Computer Engineering (Transferred to UCSD)	2016-2019
Institute of Computing Technology, Chinese Academy of Sciences Research Assistant	2014-2016
Beijing University of Aeronautics and Astronautics B.E. in Computer Engineering	2010-2014

INDUSTRY EXPERIENCE

Research Intern, VMware Research Mentor: <i>Marcos K. Aguilera</i>	Palo Alto, CA, Summer 2019
Research Intern, VMware Research Mentor: <i>Stanko Novakovic</i>	Palo Alto, CA, Summer 2018

PUBLICATIONS

Stanko Novakovic, **Yizhou Shan**, Aasheesh Kolli, Michael Cui, Yiyang Zhang, Haggai Eran, Liran Liss, Michael Wei, Dan Tsafir, Marcos Aguilera, “Storm: a fast distributed storage system using remote memory primitives”, 12th ACM International Systems and Storage Conference (***SYSTOR '19***) (**Best Paper Award**)

Yizhou Shan, Yutong Huang, Yilun Chen, Yiyang Zhang, “LegoOS: A Disseminated, Distributed OS for Hardware Resource Disaggregation”, 13th USENIX Symposium on Operating Systems Design and Implementation (***OSDI '18***) (**Best Paper Award**)

Yizhou Shan, Shin-Yeh Tsai, Yiyang Zhang, “Distributed Shared Persistent Memory”, Proceedings of the ACM Symposium on Cloud Computing 2017 (***SoCC '17***)

WORKSHOPS AND POSTERS

Yizhou Shan, Yutong Huang, Yiyang Zhang, “Challenges in Building and Deploying Disaggregated Persistent Memory”, 10th Annual Non-Volatile Memories Workshop (***NVMW '19***)

Yizhou Shan, Shin-Yeh Tsai, Yiyang Zhang, “Distributed Shared Persistent Memory”, 9th Annual Non-Volatile Memories Workshop (***NVMW '18***)

Yizhou Shan, Yiyang Zhang, “Disaggregating Memory with Software-Managed Virtual Cache”, the 2018 Workshop on Warehouse-scale Memory Systems (***WAMS '18***) (co-located with ASPLOS '18)

Yiyang Zhang, **Yizhou Shan**, Sumukh Hallymysore, “Disaggregated Operating System”, 17th International Workshop on High Performance Transaction Systems (***HPTS '17***)

Yizhou Shan, Yilun Chen, Yutong Huang, Sumukh Hallymysore, Yiyang Zhang, “Lego: A Distributed, Decomposed OS for Resource Disaggregation”, Poster at the 26th ACM Symposium on Operating Systems Principles (***SOSP '17***)

Yizhou Shan, Sumukh Hallymysore, Yutong Huang, Yilun Chen, Yiyang Zhang, “Disaggregated Operating System”, Poster at the ACM Symposium on Cloud Computing 2017 (***SoCC '17***)

AWARDS

SYSTOR '19 Best Paper Award
OSDI '18 Jay Lepreau Best Paper Award
OSDI '18 Student Travel Grant
SOSP '17 Student Travel Grant
SoCC '17 Student Travel Grant

RESEARCH EXPERIENCE

Optimize Page Fault Handling (Work-In-Progress) 2019-
VMware Research

Ancient old page fault handling is the driving wheel for many emerging datacenter systems and applications. But the page fault handling mechanism was designed for millisecond-level disk operations, there is a performance mismatch when it is used by fast devices like RDMA, or PM. We are now trying to close the gap.

Disaggregated FPGA Platform (Work-In-Progress) 2018-
Purdue University

We are building a generalized FPGA platform for future disaggregated datacenters. We envision the FPGA will be attached to ToR directly and will give services to remote monolithic servers. We are now building OS services in the FPGA and deploy couple emerging applications into it.

Disaggregated Operating System 2017-2018
Purdue University

We propose a new OS model called the splitkernel to manage disaggregated systems. Splitkernel disseminates traditional OS functionalities into loosely-coupled monitors, each of which runs on and manages a hardware component. Using the splitkernel model, we built LegoOS, a new OS designed for hardware resource disaggregation.

Distributed Shared Persistent Memory 2016-2017
Purdue University

We propose Distributed Shared Persistent Memory (DSPM), a new framework for using persistent memories in datacenter environments. We designed and implemented *Hotpot*, the first DSPM system in Linux kernel. Hotpot provides low-latency, transparent memory accesses, data persistence, data reliability and high availability.

Non-Volatile Memory (NVM) Emulator 2015-2016
Institute of Computing Technology, Chinese Academy of Sciences

We designed and implemented a NVM emulator in Linux kernel, which leverages Intel's Performance Monitoring Unit to emulate NVM's slower read/write latency and smaller bandwidth on physical DRAM. This emulator runs on bare-metal x86 machines.

ARMv8 CPU Project 2013
Institute of Computing Technology, Chinese Academy of Sciences

I participated in the Register-Transfer Level design and verification of some blocks within cache unit and load-store unit. It is commercial project collaborated with Huawei.