SOUJANYA PONNAPALLI

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WORK & EDUCATION

University of California, Berkeley **Ongoing**
Postdoc | Sky Computing Lab | EECS Department
Advisor: Prof. Natacha Crooks

University of Texas at Austin **UT-Austin**
PhD | Systems and Storage Lab | CS Department 2017-2023
Advisor: Prof. Vijay Chidambaram
Minimizing I/O Bottlenecks to Achieve Scalable and High-Throughput Systems

International Institute of Information Technology, Hyderabad **IIIT-H**
Bachelors with Honors | SERC lab | CS and Engineering
Advisor: Prof. Suresh Purini
Best all-rounder gold medal recipient

INTERESTS

Distributed systems; decentralized systems e.g., blockchains, authenticated data structures; storage systems e.g., key-value stores, file systems; systems for disaggregated memory or storage, and for modern hardware e.g., PM (Persistent Memory), CXL (Compute eXpress Link).

PREVIOUS EXPERIENCE

Microsoft Research, Redmond **Summer '22**
Mentors: Jonathan Goldstein
Achieving scalable, high-throughput txs in distributed databases along with simple recovery

Microsoft Research, Redmond **Summer '20**
Mentors: Anirudh Badam
Caching multi-modal data with harvest VMs to accelerate large-scale applications at low cost

Microsoft Research, Cambridge **Summer '19**
Mentors: Dushyanth Narayanan and Antony Rowstron
Co-designing holographic cloud storage and its I/O stack to achieve high throughput

VMware Research, California **Summer'18**
Mentors: Michael Wei and Dahlia Malkhi
Scaling blockchain throughput via sharding and efficient witness verification

RESEARCH PROJECTS

Powder: Let systems choose their consensus needs **Ongoing**
A consensus framework that allows applications to input their consensus needs, accounts for heterogeneous servers in datacenters and works with a refined model of realistic failures.

Cascades: Scalable and high-throughput txs with simple recovery **Ongoing**
Distributed database that achieves scalable and high-throughput txs without trading off the simplicity of recovering from failures; it shows improvements of up to two-orders in magnitude

Skye: Crafting PM accesses for scalably saturating PM bandwidth **Ongoing**
Monolithic key-value store that reclaims fine-grained control over all data accesses to utilize the low bandwidth of PM and CXL-attached storage devices; promises upto 2× performance.

PUBLICATIONS

DINOMO: Elastic, Scalable, High-Performance Key-Value Store for Dissagregated Persistent Memory, Sekwon Lee, **Soujanya Ponnapalli**, Sharad Singhal, Marcos K. Aguilera, Kimberly Keeton, and Vijay Chidambaram. **[VLDB-22]**

RainBlock: Faster Transaction Processing in Public Blockchains.
Soujanya Ponnapalli, Aashaka Shah, Amy Tai, Souvik Banerjee, Vijay Chidambaram, Dahlia Malkhi, and Michael Wei. **[ATC-21]**

WineFS: Hugepage-aware file system for PM that ages gracefully. Rohan Kadekodi, Saurabh Kadekodi, **Soujanya Ponnapalli**, Harshad Shirwadkar, Gregory R. Ganger, Aasheesh Kolli, and Vijay Chidambaram. **[SOSP-21]**

Software-defined data protection: Low overhead policy compliance at the storage layer is within reach! Zsolt István, **Soujanya Ponnapalli**, and Vijay Chidambaram. **[VLDB-21]**

Finding crash-consistency bugs with bounded black-box crash testing. Jayashree Mohan, Ashlie Martinez, **Soujanya Ponnapalli**, Pandian Raju, and Vijay Chidambaram. **[OSDI-18]**

mLSM: Making authenticated storage faster in ethereum.
Pandian Raju, **Soujanya Ponnapalli**, Evan Kaminsky, Gilad Oved, Zachary Keener, Vijay Chidambaram, and Ittai Abraham. **[HotStorage-18]**

SERVICE

Technical Program Committee, NSDI **2025**
Technical Program Committee, Eurosys **2025**
External Review Committee, ATC **2024**
Reviewer, ACM Journal, TOCS **2024**
Hallway Discussion Lead for SOSP **2021**
Chair for Graduate Application Assistance Program (GAAP@UT) **2020**
Shadow PC for Eurosys **2020**
External Reviewer for NSDI **2019**

ACADEMIC EXPERIENCE

Teaching Assistant at UT-Austin **Fall-20,23**
Virtualization with Prof. Vijay Chidambaram

Research Assistant at UT-Austin **2017-20,21-23**
Advisor: Prof. Vijay Chidambaram

Research and Teaching Assistant at IIIT-H **2015-2017**
Algorithms and Data Structures with Prof. Kishore Kothapalli
Operating Systems with Prof. Suresh Purini
Electrical Science with Prof. Rambabu Kalla

TALKS

Scaling Transaction Throughput in Public Blockchains **[SDN-22]**
RainBlock: Faster Transaction Processing in Public Blockchains **[ATC-21, MSR]**
Blockchains and their Scalability Limitations **[LASR, UT-Austin]**
mLSM: Making Authenticated Storage Faster in Ethereum **[HotStorage-18, VRG]**
Finding Crash Consistency Bugs with Bounded Black-Box Crash Testing **[VRG]**

POSTERS

Eureka! We can let your systems decide their consensus needs **[OSDI-24]**
Recovery can be simple! High-throughput txs for distributed databases **[SkyRetreat-24]**
CrashML: Making Systematic Crash Testing of File Systems Feasible **[OSDI-18]**
mLSM: Making Authenticated Storage Faster in Ethereum **[HotStorage-18]**

AWARDS

The James C. Browne Graduate Fellowship **2017-18**
Recipient of the James C. Browne Graduate Fellowship at UT Austin

IIIT-H Best All-rounder **2017**
Recipient of the IIIT-H gold medal as the best all-rounder of the batch UG2k13

Dean's Award for ranking in the top 5% of the students at IIIT-H

TRAVEL GRANTS

SOSP Travel Scholarship **2019**
Recipient of ACM SOSP 2019 Scholarship

USENIX Student Travel Grant **2018**
Recipient of USENIX Travel grants to attend OSDI'18 and ATC'18

EXTRA-CURRICULARS

Databases seminar | **Sky Computing Lab** | **Berkeley** **2024**
Co-organizer of Database systems seminar for Summer'24, Fall'24, Spring'25.

Graduate Representative Association of Computer Sciences | **UTCS** **2020-21**
Member of the GRACS committee.

Systems seminar | **Lab for Advanced Systems Research** | **Austin** **2018**
Co-organizer of LASR systems seminar for Fall 2018.

Member of IIIT-H cultural council **2013-2017**
Member of the Cultural Council for the batch of 2013.

Sports Ccordinator and representative at IIIT-H **2014-16**
Sports coordinator and representative of the Prithvi house of IIIT-H.

REFERENCES

Available upon request