Christos Kozyrakis research focuses on making computer system of any size faster, cheaper, and greener. His current work focuses on the hardware architecture, runtime environment, programming models, and security infrastructure for warehouse-scale data centers and many-core chips with thousands of general purpose cores and fixed functions accelerators.
Teaching

COURSES

2022-23
• An Intro to Making: What is EE: ENGR 40M (Spr)
• Cloud Computing Technology: CS 349D (Spr)
• Colloquium on Computer Systems: EE 380 (Win, Spr)
• Digital Systems Architecture: EE 180 (Win)

2021-22
• Cloud Computing Technology: CS 349D (Aut)
• Colloquium on Computer Systems: EE 380 (Win, Spr)
• Computer Systems from the Ground Up: CS 107E (Spr)
• Digital Systems Architecture: EE 180 (Win)

2020-21
• Computer Systems Architecture: EE 282 (Win)
• Computer Systems from the Ground Up: CS 107E (Aut)

2019-20
• Computer Systems Architecture: EE 282 (Win)
• Digital Systems Architecture: EE 180 (Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)
Daniel Kang, Jeff Setter, Travis Skare

Doctoral Dissertation Advisor (AC)
Timothy Chong, Qian Li, Francisco Romero, Athinagoras Skiadopoulos, Yawen Wang, Mark Zhao, Chenzhuo Zhu

Orals Evaluator
Daniel Kang, Yilong Li

Master's Program Advisor
Andrew Bartolo, Arjun Deopujari, Zixin Huang, Kevin Marx, Swayam Parida, Ishan Sabane, Vidisha Srivastav, Derian Williams

Doctoral (Program)
Timothy Chong, Kathleen Feng, Jack Humphries, Qian Li, Qiao(yi) Joey Liu, Francisco Romero, Geet Sethi, Athinagoras Skiadopoulos, Yawen Wang, Mark Zhao

Publications

PUBLICATIONS

• RAIL: Predictable, Low Tail Latency for NVMe Flash *ACM TRANSACTIONS ON STORAGE*
  Litz, H., Gonzalez, J., Klimovic, A., Kozyrakis, C.
  2022; 18 (1)

• DBOS: A DBMS-oriented Operating System
  Skiadopoulos, A., Li, Q., Kraft, P., Kaffes, K., Hong, D., Mathew, S., Bestor, D., Cafarella, M., Gadepally, V., Graefe, G., Kepner, J., Kozyrakis, C., Kraska, et al
• RAMBO: Resource Allocation for Microservices Using Bayesian Optimization  
  IEEE COMPUTER ARCHITECTURE LETTERS  
  Li, Q., Li, B., Mercati, P., Illikkal, R., Tai, C., Kishinevsky, M., Kozyrakis, C.  
  2021; 20 (1): 46–49

• INFaaS: Automated Model-less Inference Serving  
  Romero, F., Li, Q., Yadwadkar, N. J., Kozyrakis, C., USENIX ASSOC  
  USENIX ASSOC.2021: 397-411

• LLAMA: A Heterogeneous & Serverless Framework for Auto-Tuning Video Analytics Pipelines  
  Romero, F., Zhao, M., Yadwadkar, N. J., Kozyrakis, C., ACM  
  ASSOC COMPUTING MACHINERY.2021: 1-17

• FaaST: A Transparent Auto-Scaling Cache for Serverless Applications  
  ASSOC COMPUTING MACHINERY.2021: 122-137

• SmartHarvest: Harvesting Idle CPUs Safely and Efficiently in the Cloud  
  ASSOC COMPUTING MACHINERY.2021: 1-16

• AsmDB: Understanding and Mitigating Front-End Stalls in Warehouse-Scale Computers  
  Nagendra, N., Ayers, G., August, D. I., Cho, H., Kane, S., Kozyrakis, C., Krishnamurthy, T., Litz, H., Moseley, T., Ranganathan, P.  
  2020; 40 (3): 56–63

• The Hot Chips Renaissance  
  Kozyrakis, C., Bratt, I.  
  2020; 40 (2): 6–7

• Leveraging application classes to save power in highly-utilized data centers  
  Kaffes, K., Shirlea, D., Lin, Y., Lo, D., Kozyrakis, C.  
  2020

• RackSched: A Microsecond-Scale Scheduler for Rack-Scale Computers  
  Zhu, H., Kaffes, K., Chen, Z., Liu, Z., Kozyrakis, C., Stoica, I., Jin, X., USENIX Assoc  
  USENIX ASSOC.2020: 1225-1240

• Classifying Memory Access Patterns for Prefetching  
  Ayers, G., Litz, H., Kozyrakis, C., Ranganathan, P., ACM  
  ASSOC COMPUTING MACHINERY.2020: 513–26

• Interstellar: Using Halide’s Scheduling Language to Analyze DNN Accelerators  
  Yang, X., Gao, M., Liu, Q., Setter, J., Pu, J., Nayak, A., Bell, S., Cao, K., Ha, H., Raina, P., Kozyrakis, C., Horowitz, M., ACM  
  ASSOC COMPUTING MACHINERY.2020: 369–83

• Mind the Gap: A Case for Informed Request Scheduling at the NIC  
  Humphries, J., Kaffes, K., Mazieres, D., Kozyrakis, C., ACM  
  ASSOC COMPUTING MACHINERY.2019: 60–68

• AsmDB: Understanding and Mitigating Front-End Stalls in Warehouse-Scale Computers  
  Ayers, G., Nagendra, N., August, D., Cho, H., Kanev, S., Kozyrakis, C., Krishnamurthy, T., Litz, H., Moseley, T., Ranganathan, P., ACM  
  ASSOC COMPUTING MACHINERY.2019: 462–73

• From Laptop to Lambda: Outsourcing Everyday Jobs to Thousands of Transient Functional Containers  
  Fouladi, S., Romero, F., Iter, D., Li, Q., Chatterjee, S., Kozyrakis, C., Zaharia, M., Weinstein, K., USENIX Assoc  
  USENIX ASSOC.2019: 475–88

• TANGRAM: Optimized Coarse-Grained Dataflow for Scalable NN Accelerators  
  ASPLOS ’19: Proceedings of the Twenty-Fourth International Conference on Architectural Support for Programming Languages and Operating Systems  
  Gao, M., Yang, X., Pu, J., Horowitz, M., Kozyrakis, C.
2019: 807–20

- Centralized Core-granular Scheduling for Serverless Functions *SoCC '19: ACM Symposium on Cloud Computing*
  Kaffes, K., Yadwadkar, N. J., Kozyrakis, C.
  2019

- Shinjuku: Preemptive Scheduling for μs second-scale Tail Latency
  Kaffes, K., Chong, T., Humphries, J., Belay, A., Mazieres, D., Kozyrakis, C., USENIX Assoc
  USENIX ASSOC.2019: 345–59

- A Case for Managed and Model-less Inference Serving
  Yadwadkar, N. J., Romero, F., Li, Q., Kozyrakis, C., ACM
  ASSOC COMPUTING MACHINERY.2019: 184–91

- QuMan: Profile-based Improvement of Cluster Utilization *ACM TRANSACTIONS ON ARCHITECTURE AND CODE OPTIMIZATION*
  Sfakianakis, Y., Kozanitis, C., Kozyrakis, C., Bilas, A.
  2018; 15 (3)

- Amdahl's Law for Tail Latency *COMMUNICATIONS OF THE ACM*
  Delimitrou, C., Kozyrakis, C.
  2018; 61 (8): 65–72

- Uncovering the Security Implications of Cloud Multi-Tenancy with Bolt *IEEE MICRO*
  Delimitrou, C., Kozyrakis, C.
  2018; 38 (3): 86–97

- Plasticine: A Reconfigurable Accelerator for Parallel Patterns *IEEE MICRO*
  Prabhakar, R., Zhang, Y., Koeplinger, D., Feldman, M., Zhao, T., Hadjis, S., Pedram, A., Kozyrakis, C., Olukotun, K.
  2018; 38 (3): 20–31

- GraphP: Reducing Communication for PIM-based Graph Processing with Efficient Data Partition
  IEEE.2018: 544–57

- Making Pull-Based Graph Processing Performant
  Grossman, S., Litz, H., Kozyrakis, C.
  ASSOC COMPUTING MACHINERY.2018: 246–60

- Memory Hierarchy for Web Search
  Ayers, G., Ahn, J., Kozyrakis, C., Ranganathan, P., IEEE
  IEEE.2018: 643–56

- The IX Operating System: Combining Low Latency, High Throughput, and Efficiency in a Protected Dataplane (vol 34, pg 11, 2017) *ACM TRANSACTIONS ON COMPUTER SYSTEMS*
  2017; 35 (3)

- TETRIS: Scalable and Efficient Neural Network Acceleration with 3D Memory *ACM SIGPLAN NOTICES*
  Gao, M., Pu, J., Yang, X., Horowitz, M., Kozyrakis, C.
  2017; 52 (4): 751-764

- Bolt: I Know What You Did Last Summer... In the Cloud *ACM SIGPLAN NOTICES*
  Delimitrou, C., Kozyrakis, C.
  2017; 52 (4): 599-613

- ReFlex: Remote Flash approximate to Local Flash *ACM SIGPLAN NOTICES*
  Klimovic, A., Litz, H., Kozyrakis, C.
  2017; 52 (4): 345-359

- The IX Operating System: Combining Low Latency, High Throughput, and Efficiency in a Protected Dataplane *ACM TRANSACTIONS ON COMPUTER SYSTEMS*
2017; 34 (4)

- **Persona: A High-Performance Bioinformatics Framework**
  Bysta, S., Whitlock, S., Fleratoru, L., Tseng, E., Kozyrakis, C., Bugnion, E., Larus, J., USENIX Assoc
  USENIX ASSOC.; 20.17: 153–65

- **Special Session Paper 3D Nanosystems Enable Embedded Abundant-Data Computing**
  IEEE; 2017

- **Security Implications of Data Mining in Cloud Scheduling** *IEEE COMPUTER ARCHITECTURE LETTERS*
  Delimitrou, C., Kozyrakis, C.

- **Improving Resource Efficiency at Scale with Heracles** *ACM TRANSACTIONS ON COMPUTER SYSTEMS*
  Lo, D., Cheng, L., Govindaraju, R., Ranganathan, P., Kozyrakis, C.
  2016; 34 (2)

- **Generating Configurable Hardware from Parallel Patterns** *ACM SIGPLAN NOTICES*
  2016; 51 (4): 651-665

- **HCloud: Resource-Efficient Provisioning in Shared Cloud Systems** *ACM SIGPLAN NOTICES*
  Delimitrou, C., Kozyrakis, C.
  2016; 51 (4): 473-488

- **Energy-Efficient Abundant-Data Computing: The N3XT 1,000x** *COMPUTER*
  2015; 48 (12): 24-33

- **Convolution Engine: Balancing Efficiency and Flexibility in Specialized Computing** *COMMUNICATIONS OF THE ACM*
  Qadeer, W., Hameed, R., Shacham, O., Venkatesan, P., Kozyrakis, C., Horowitz, M.
  2015; 58 (4): 85-93

- **QUALITY-OF-SERVICE-AWARE SCHEDULING IN HETEROGENEOUS DATACENTERS WITH PARAGON** *IEEE MICRO*
  Delimitrou, C., Kozyrakis, C.
  2014; 34 (3): 17-30

- **Quasar: Resource-Efficient and QoS-Aware Cluster Management** *ACM SIGPLAN NOTICES*
  Delimitrou, C., Kozyrakis, C.
  2014; 49 (4): 127-143

- **Dynamic Management of TurboMode in Modern Multi-core Chips**
  Patterson, D., Kozyrakis, C.
  2014

- **Quasar: Resource-Efficient and QoS-Aware Cluster Management**
  Delimitrou, C., Kozyrakis, C.
  2014

- **QoS-Aware Scheduling in Heterogeneous Datacenters with Paragon** *ACM TRANSACTIONS ON COMPUTER SYSTEMS*
  Delimitrou, C., Kozyrakis, C.
  2013; 31 (4)

- **Measuring and analyzing the energy use of enterprise computing systems** *SUSTAINABLE COMPUTING-INFORMATICS & SYSTEMS*
  Kazandjieva, M., Heller, B., Gnawali, O., Levis, P., Kozyrakis, C.
  2013; 3 (3): 218-229

- **Paragon: QoS-Aware Scheduling for Heterogeneous Datacenters** *ACM SIGPLAN NOTICES*
  Delimitrou, C., Kozyrakis, C.
Guest Editors' Introduction SELECTED RESEARCH FROM HOT CHIPS 24 IEEE MICRO
Kozyrakis, C., Zahir, R.
2013; 33 (2): 6-7

The Netflix Challenge: Datacenter Edition IEEE COMPUTER ARCHITECTURE LETTERS
Delimitrou, C., Kozyrakis, C.
2013; 12 (1): 29-32

iBench: Quantifying Interference for Datacenter Applications IEEE International Symposium on Workload Characterization (IISWC)
Delimitrou, C., Kozyrakis, C.
IEEE 2013: 23–33

ZSim: Fast and Accurate Microarchitectural Simulation of Thousand-Core Systems
Sanchez, D., Kozyrakis, C.
2013

iBench: Quantifying Interference for Datacenter Workloads
Delimitrou, C., Kozyrakis, C.
2013

Convolution Engine: Balancing Efficiency and Flexibility in Specialized Computing
Qadeer, W., Hameed, R., Shacham, O., Venkatesan, P., Kozyrakis, C., Horowitz, M.
2013

Measuring and analyzing the energy use of enterprise computing systems Sustainable Computing: Informatics and Systems
Kazandjieva, M., Heller, B., Gnawali, O., Levis, P., Kozyrakis, C.
2013

Resource Efficient Computing for Warehouse-scale Datacenters
Kozyrakis, C.
2013

QoS-Aware Admission Control in Heterogeneous Datacenters
Delimitrou, C., Bambos, N., Kozyrakis, C.
2013

Enhanced Concurrency Control with Transactional NACKs
Baek, W., Yoo, R., Kozyrakis, C.
2013

Locality-Aware Task Management for Unstructured Parallelism: A Quantitative Limit Study
Yoo, R., Hughes, C., Kim, C., Chen, Y., Kozyrakis, C.
2013

QoS-Aware Scheduling in Heterogeneous Datacenters with Paragon ACM Transactions on Computer Systems (TOCS)
Delimitrou, C., Kozyrakis, C.
2013; 31 (4)

Decoupling Datacenter Storage Studies from Access to Large-Scale Applications IEEE COMPUTER ARCHITECTURE LETTERS
Delimitrou, C., Sankar, S., Vaid, K., Kozyrakis, C.
2012; 11 (2): 53-56

SCALABLE AND EFFICIENT FINE-GRAINED CACHE PARTITIONING WITH VANTAGE IEEE MICRO
Sanchez, D., Kozyrakis, C.
2012; 32 (3): 26-37

Hardware Acceleration of Transactional Memory on Commodity Systems ACM SIGPLAN NOTICES
Casper, J., Oguntebi, T., Hong, S., Bronson, N. G., Kozyrakis, C., Olukotun, K.
• Improving System Energy Efficiency with Memory Rank Subsetting *ACM TRANSACTIONS ON ARCHITECTURE AND CODE OPTIMIZATION*
  Ahn, J. H., Jouppi, N. P., Kozyrakis, C., Leverich, J., Schreiber, R. S.
  2012; 9 (1)

• Green Enterprise Computing Data: Assumptions and Realities *3rd International Green Computing Conference (IGCC)*
  Kazandjieva, M., Heller, B., Gnawali, O., Levis, P., Kozyrakis, C.
  IEEE.2012

• Dune: Safe User-level Access to Privileged CPU Features
  Belay, A., Bittau, A., Mashitizadeh, A., Terei, D., Mazie`res, D., Kozyrakis, C.
  2012

• ECHO: Recreating Network Traffic Maps for Datacenters of Tens of Thousands of Servers
  Delimitrou, C., Sanka, S., Kansal, A., Kozyrakis, C.
  2012

• A Case of System-level Hardware/Software Co-design and Co-verification of a Commodity Multi-Processor System with Custom Hardware *10th ACM International Conference on Hardware/Software-Codesign and System Synthesis*
  Hong, S., Oguntebi, T., Casper, J., Bronson, N., Kozyrakis, C., Olukotun, K.
  ASSOC COMPUTING MACHINERY.2012: 513–519

• Towards Energy-Proportional Datacenter Memory with Mobile DRAM *39th Annual International Symposium on Computer Architecture (ISCA)*
  Malladi, K. T., Nothaft, F. A., Periyathambi, K., Lee, B. C., Kozyrakis, C., Horowitz, M.
  IEEE.2012: 37–48

• SCD: A Scalable Coherence Directory with Flexible Sharer Set Encoding *18th IEEE International Symposium on High-Performance Computer Architecture (HPCA)*
  Sanchez, D., Kozyrakis, C.
  IEEE.2012: 129–140

• Understanding Sources of Inefficiency in General-Purpose Chips *COMMUNICATIONS OF THE ACM*
  Hameed, R., Qadeer, W., Wachs, M., Azizi, O., Solomatnikov, A., Lee, B. C., Richardson, S., Kozyrakis, C., Horowitz, M.
  2011; 54 (10): 85-93

• The Case for RAMCloud *COMMUNICATIONS OF THE ACM*
  2011; 54 (7): 121-130

• Hardware Acceleration of Transactional Memory on Commodity Systems *ACM SIGPLAN NOTICES*
  Casper, J., Oguntebi, T., Hong, S., Bronson, N. G., Kozyrakis, C., Olukotun, K.
  2011; 46 (3): 27-38

• Decoupling Datacenter Studies from Access to Large-Scale Applications: A Modeling Approach for Storage Workloads *IEEE International Symposium on Workload Characterization (IISWC)*
  Delimitrou, C., Sankar, S., Vaid, K., Kozyrakis, C.
  IEEE.2011: 51–60

• Storage I/O Generation and Replay for Datacenter Applications
  Delimitrou, C., Sankar, S., Vaid, K., Kozyrakis, C.
  2011

• Time and Cost-Efficient Modeling and Generation of Large-Scale TPCC/TPCE/TPCH
  Delimitrou, C., Sankar, S., Khessib, B., Vaid, K., Kozyrakis, C.
  2011

• Phoenix++: Modular MapReduce for Shared-Memory Systems
  Talbot, J., Yoo, R., Kozyrakis, C.
  2011
• Dynamic Fine-Grain Scheduling of Pipeline Parallelism
Sanchez, D., Lo, D., Yoo, R., Sugerman, J., Kozyrakis, C.
2011

• Accurate Modeling and Generation of Storage I/O for Datacenter Workloads
Delimitrou, C., Sankar, S., Vaid, K., Kozyrakis, C.
2011

• Understanding Sources of Inefficiency in General-Purpose Chips Communications of the ACM (CACM)
Hameed, R., Qadeer, W., Wachs, M., Azizi, O., Solomatnikov, A., Lee, Benjamin, C., Kozyrakis, C.
2011; 54 (10)

• Vantage: Scalable and Efficient Fine-Grain Cache Partitioning 38th Annual International Symposium on Computer Architecture
Sanchez, D., Kozyrakis, C.
ASSOC COMPUTING MACHINERY.2011: 57–68

• SERVER ENGINEERING INSIGHTS FOR LARGE-SCALE ONLINE SERVICES IEEE MICRO
Kozyrakis, C., Kansal, A., Sankar, S., Vaid, K.
2010; 30 (4): 8-19

• An Analysis of On-Chip Interconnection Networks for Large-Scale Chip Multiprocessors ACM TRANSACTIONS ON ARCHITECTURE AND CODE OPTIMIZATION
Sanchez, D., Michelogiannakis, G., Kozyrakis, C.
2010; 7 (1)

• Flexible Architectural Support for Fine-Grain Scheduling ACM SIGPLAN NOTICES
Sanchez, D., Yoo, R. M., Kozyrakis, C.
2010; 45 (3): 311-322

• Understanding Sources of Inefficiency in General-Purpose Chips 37th International Symposium on Computer Architecture
Hameed, R., Qadeer, W., Wachs, M., Azizi, O., Solomatnikov, A., Lee, B. C., Richardson, S., Kozyrakis, C., Horowitz, M.
ASSOC COMPUTING MACHINERY.2010: 37–47

• FARM: A Prototyping Environment for Tightly-Coupled, Heterogeneous Architectures
Oguntebi, T., Hong, S., Casper, J., Bronson, N., Kozyrakis, C., Olukotun, K.
2010

• Tainting is Not Pointless ACM SIGOPS Operating Systems Review
Dalton, M., Kannan, H., Kozyrakis, C.
2010; 44 (2)

• Making Nested Parallel Transactions Practical using Lightweight Hardware Support
Baek, W., Bronson, N., Kozyrakis, C., Olukotun, K.
2010

• EigenBench: A Simple Exploration Tool for Orthogonal TM Characteristics
Hong, S., Oguntebi, T., Casper, J., Bronson, N., Kozyrakis, C., Olukotun, K.
2010

• The ZCache: Decoupling Ways and Associativity
Sanchez, D., Kozyrakis, C.
2010

• Implementing and Evaluating a Model Checker for Transactional Memory Systems
Baek, W., Bronson, N., Kozyrakis, C., Olukotun, K.
2010

• Evaluating Bufferless Flow Control for On-Chip Networks
Michelogiannakis, G., Sanchez, D., Dally, William, J., Kozyrakis, C.
2010
• Implementing and Evaluating Nested Parallel Transactions in Software Transactional Memory 22nd ACM Symposium on Parallelism in Algorithms and Architectures
Baek, W., Bronson, N., Kozyrakis, C., Olukotun, K.
ASSOC COMPUTING MACHINERY.2010: 253–262

• Power Management of Datacenter Workloads Using Per-Core Power Gating IEEE COMPUTER ARCHITECTURE LETTERS
Leverich, J., Monchiero, M., Talwar, V., Ranganathan, P., Kozyrakis, C.
2009; 8 (2): 48-51

• HOT CHIPS TURNS 20 IEEE MICRO
Kozyrakis, C., van de Waerdt, J.
2009; 29 (2): 4-5

• Phoenix Rebirth: Scalable MapReduce on a Large-Scale Shared-Memory System IEEE International Symposium on Workload Characterization
Yoo, R. M., Romano, A., Kozyrakis, C.
IEEE COMPUTER SOC.2009: 198–207

• On the Energy (In)Efficiency of Hadoop Clusters
Leverich, J., Kozyrakis, C.
2009

• On the Energy (In)Efficiency of Hadoop Clusters
Leverich, J., Kozyrakis, C.
2009

• The Stanford Pervasive Parallelism Lab
Kozyrakis, C., Olukotun, K.
2009

• Energy Dumpster Diving
Kazandjieva, M., Heller, B., Levis, P., Kozyrakis, C.
2009

• Energy Dumpster Diving
Kazandjieva, M., Heller, B., Levis, P., Kozyrakis, C.
2009

• Nemesis: Preventing Authentication & Access Control Vulnerabilities in Web Applications
Dalton, M., Kozyrakis, C., Zeldovich, N.
2009

• The case for RAMClouds: scalable high-performance storage entirely in DRAM ACM SIGOPS Operating Systems Review
Ousterhout, J., Agrawal, P., Erickson, D., Kozyrakis, C., Leverich, J., Mazières, D.
2009; 43 (4)

• Future Scaling of Processor-Memory Interfaces Conference on High Performance Computing Networking, Storage and Analysis
Ahn, J. H., Jouppi, N. P., Kozyrakis, C., Leverich, J., Schreiber, R. S.
IEEE.2009

• Fast Memory Snapshot for Concurrent Programming without Synchronization ACM SIGARCH International Conference on Supercomputing
Chung, J., Baek, W., Kozyrakis, C.
ASSOC COMPUTING MACHINERY.2009: 117–125

• A Memory System Design Framework: Creating Smart Memories 36th Annual International Symposium on Computer Architecture
Firoozshahian, A., Solomatnikov, A., Shacham, O., Asgar, Z., Richardson, S., Kozyrakis, C., Horowitz, M.
ASSOC COMPUTING MACHINERY.2009: 406–417

• Decoupling Dynamic Information Flow Tracking with a Dedicated Coprocessor 39th Annual IEEE/IFIP International Conference on Dependable Systems and Networks
Kannan, H., Dalton, M., Kozyrakis, C.
Feedback-Directed Barrier Optimization in a Strongly Isolated STM. *ACM SIGPLAN NOTICES*
Bronson, N. G., Kozyrakis, C., Olukotun, K.
2009; 44 (1): 213-225

Comparative Evaluation of Memory Models for Chip Multiprocessors. *ACM TRANSACTIONS ON ARCHITECTURE AND CODE OPTIMIZATION*
Leverich, J., Arakida, H., Solomatnikov, A., Firoozshahian, A., Horowitz, M., Kozyrakis, C.
2008; 5 (3)

**Transactional memory**. *COMMUNICATIONS OF THE ACM*
Larus, J., Kozyrakis, C.
2008; 51 (7): 80-88

Improving Software Concurrency with Hardware-assisted Memory Snapshot. *20th ACM Symposium on Parallelism in Algorithms and Architectures*
Chung, J., Seo, J., Baek, W., Min, C. C., McDonald, A., Kozyrakis, C., Olukotun, K.
ASSOC COMPUTING MACHINERY.2008: 363–363

Hardware Enforcement of Application Security Policies
Zeldovich, N., Kannan, H., Dalton, M., Kozyrakis, C.
2008

A Comparison of High-Level Full-System Power Models
Rivoire, S., Ranganathan, P., Kozyrakis, C.
2008

Real-World Buffer Overflow Protection for Userspace and Kernelspace
Dalton, M., Kannan, H., Kozyrakis, C.
2008

ASeD: Availability, Security, and Debugging Support using Transactional Memory. *20th ACM Symposium on Parallelism in Algorithms and Architectures*
Chung, J., Baek, W., Bronson, N. G., Seo, J., Kozyrakis, C., Olukotun, K.
ASSOC COMPUTING MACHINERY.2008: 366–366

STAMP: Stanford Transactional Applications for Multi-Processing. *IEEE International Symposium on Workload Characterization*
Minh, C. C., Chung, J., Kozyrakis, C., Olukotun, K.
IEEE.2008: 31–42

Thread-Safe Dynamic Binary Translation using Transactional Memory. *14th International Symposium on High-Performance Computer Architecture*
Chung, J., Dalton, M., Kannan, H., Kozyrakis, C.
IEEE.2008: 256–266

Models and metrics to enable energy-efficiency optimizations. *COMPUTER*
Rivoire, S., Shah, M. A., Ranganathan, P., Kozyrakis, C., Meza, J.
2007; 40 (12): 39-?

RAMP: Research accelerator for multiple processors. *Hot Chips 18 Conference*
Wawrzynek, J., Patterson, D., Oskin, M., Lu, S., Kozyrakis, C., Hoe, J. C., Chiou, D., Asanovic, K.
IEEE COMPUTER SOC.2007: 46–57

Towards Soft Optimization Techniques for Parallel Cognitive Applications. *19th Annual Symposium on Parallelism in Algorithms and Architectures*
Baek, W., Chung, J., Min, C. C., Kozyrakis, C., Olukotun, K.
ASSOC COMPUTING MACHINERY.2007: 59–60

The OpenTM Transactional Application Programming Interface
Baek, W., Min, C. C., Trautmann, M., Kozyrakis, C., Olukotun, K.
2007

RAMP: Research Accelerator for Multiple Processors. *IEEE Micro*
Wawrzynek, J., Patterson, D., Oskin, M., Lu, S., Kozyrakis, C., Hoe, J.
• A Low Power Front-end for Embedded Processors using a Block-aware Instruction Set
  Zmily, A., Kozyrakis, C.
  2007

• JouleSort: A Balanced Energy-Efficiency Benchmark
  Rivoire, S., Shah, Mehul, A., Ranganathan, P., Kozyrakis, C.
  2007

• Raksha: A Flexible Architecture for Software Security
  Kannan, H., Dalton, M., Kozyrakis, C.
  2007

• Raksha: A Flexible Information Flow Architecture for Software Security
  34th Annual International Symposium on Computer Architecture
  Dalton, M., Kannan, H., Kozyrakis, C.
  ASSOC COMPUTING MACHINERY.2007: 482–493

• A Practical FPGA-based Framework for Novel CMP Research
  15th ACM/SIGDA International Symposium on Field-Programmable Gate Arrays
  Wee, S., Casper, J., Njoroge, N., Teslyar, Y., Ge, D., Kozyrakis, C., Olukotun, K.
  ASSOC COMPUTING MACHINERY.2007: 116–125

• Transactional Collection Classes
  ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming
  Carlstrom, B. D., McDonald, A., Carbin, M., Kozyrakis, C., Olukotun, K.
  ASSOC COMPUTING MACHINERY.2007: 56–67

• ATLAS: A chip-multiprocessor with Transactional Memory support
  Design, Automation and Test in Europe Conference and Exhibition (DATE 07)
  Njoroge, N., Casper, J., Wee, S., Teslyar, Y., Ge, D., Kozyrakis, C., Olukotun, K.
  IEEE.2007: 3–8

• Transactional memory: The hardware-software interface
  IEEE MICRO
  McDonald, A., Carlstrom, B. D., Chung, J., Minh, C. C., Chafi, H., Kozyrakis, C., Olukotun, K.
  2007; 27 (1): 67-76

• Comparing Memory Systems for Chip Multiprocessors
  34th Annual International Symposium on Computer Architecture
  Leverich, J., Arakida, H., Solomatnikov, A., Firoozshahian, A., Horowitz, M., Kozyrakis, C.
  ASSOC COMPUTING MACHINERY.2007: 358–368

• An Effective Hybrid Transactional Memory System with Strong Isolation Guarantees
  34th Annual International Symposium on Computer Architecture
  Minh, C. C., Trautmann, M., Chung, J., McDonald, A., Bronson, N., Casper, J., Kozyrakis, C., Olukotun, K.
  ASSOC COMPUTING MACHINERY.2007: 69–80

• A scalable, non-blocking approach to transactional memory
  13th International Symposium on High-Performance Computer Architecture
  Chafi, H., Casper, J., Carlstrom, B. D., McDonald, A., Minh, C. C., Baek, W., Kozyrakis, C., Olukotun, K.
  IEEE COMPUTER SOC.2007: 97–108

• Register pointer architecture for efficient embedded processors
  Design, Automation and Test in Europe Conference and Exhibition (DATE 07)
  Park, J., Park, S., Balfour, J. D., Black-Schaffer, D., Kozyrakis, C., Dally, W. J.
  IEEE.2007: 600–605

• Evaluating MapReduce for multi-core and multiprocessor systems
  13th International Symposium on High-Performance Computer Architecture
  Ranger, C., Raghuraman, R., Pennmetsa, A., Bradski, G., Kozyrakis, C.
  IEEE COMPUTER SOC.2007: 13–24

• Executing Java programs with transactional memory
  OOPSLA Workshop on Synchronization and Concurrent in Object-Oriented Languages
  Carlstrom, B. D., Chung, J., Chafi, H., McDonald, A., Minh, C. C., Hammond, L., Kozyrakis, C., Olukotun, K.
  ELSEVIER SCIENCE BV 2006: 111–29

• Tradeoffs in transactional memory virtualization
  ACM SIGPLAN NOTICES
  Chung, J., Minh, C. C., McDonald, A., Skare, T., Chafi, H., Carlstrom, B. D., Kozyrakis, C., Olukotun, K.
• The ATOMO Sigma transactional programming language *ACM SIGPLAN NOTICES*
  Carlstrom, B. D., McDonald, A., Chafi, H., Chung, J., Minh, C. C., Kozyrakis, C., Olukotun, K.
  2006; 41 (6): 1-13

• Vector lane threading *35th International Conference on Parallel Processing*
  Rivoire, S., Schultz, R., Okuda, T., Kozyrakis, C.
  IEEE COMPUTER SOC. 2006: 55–62

• Parallelizing SPECjbb2000 with Transactional Memory
  Chung, J., Minh, C. C., Carlstrom, Brian, D., Kozyrakis, C.
  2006

• Early Release: Friend or Foe
  Skare, T., Kozyrakis, C.
  2006

• Deconstructing Hardware Architectures for Security
  Dalton, M., Kannan, H., Kozyrakis, C.
  2006

• Unlocking Concurrency: Multicore Programming with Transactional Memory *ACM Queue*
  Adl-Tabatabai, A., Kozyrakis, C., Saha, B.
  2006; 4 (10)

• Library-based Prefetching for Pointer Intensive Applications *Online Technical Manuscript*
  Malhotra, V., Kozyrakis, C.
  2006

• Building and Using the ATLAS Transactional Memory System
  Njoroge, N., Wee, S., Casper, J., Burdick, J., Teslyar, Y., Kozyrakis, C.
  2006

• Tutorial: Transactional Programming In A Multi-core Environment
  Adl-Tabatabai, A., Kozyrakis, C., Saha, B.
  2006

• CSEARCH: Cognition Enabled Architecture
  Crago, S., McMahon, et al., J.
  2006

• The Software Stack for Transactional Memory: Challenges and Opportunities
  Carlstrom, Brian, D., Chung, J., Kozyrakis, C., Olukotun, K.
  2006

• Full-system Power Analysis and Modeling for Server Environments
  Economou, D., Rivoire, S., Kozyrakis, C., Ranganathan, P.
  2006

• Testing Implementations of Transactional Memory
  Manovit, C., Hangal, S., McDonald, A., Chafi, H., Kozyrakis, C., Olukotun, K.
  2006

• RAMP: Research Accelerator for Multiple Processors
  Arvind, D., Patterson, Asanovic, K., Chiou, D., Hoe, J., Kozyrakis, C., Lu, S.
  2006

• From Chaos to QoS: Case Studies in CMP Resource Management
  Kannan, H., Guo, F., Zhao, L., Illikkal, R., Iyer, R., Newell, D., Kozyrakis, C.
• **Block Aware Instruction Set Architecture** *ACM Transactions on Architecture and Code Optimization*
  Zmily, A., Kozyrakis, C.
  2006; 3 (3): 327–357

• **The common case transactional behavior of multithreaded programs** *22th International Symposium on High-Performance Computer Architecture*
  Chung, J., Chafi, H., Minh, C. C., McDonald, A., Carlstrom, B., Kozyrakis, C., Olukotun, K.
  IEEE COMPUTER SOC.2006: 271–282

• **Simultaneously improving code size, performance, and energy in embedded processors** *Design, Automation and Test in Europe Conference and Exhibition (DATE 06)*
  Zmily, A., Kozyrakis, C.
  IEEE.2006: 222–227

• **Architectural semantics for practical Transactional Memory** *33rd International Symposium on Computer Architecture*
  McDonald, A., Chung, J., Carlstrom, B. D., Minh, C. C., Chafi, H., Kozyrakis, C., Olukotun, K.
  IEEE COMPUTER SOC.2006: 53–64

• **Heuristics for profile-driven method-level speculative parallelization** *34th International Conference on Parallel Processing (ICPP)*
  Whaley, J., Kozyrakis, C.
  IEEE COMPUTER SOC.2005: 147–156

• **Transactional Execution of Java Programs**
  Carlstrom, Brian, D., Chung, J., Chafi, H., McDonald, A., Hammond, C. M., Kozyrakis, C.
  2005

• **TAPE: a Transactional Application Profiling Environment**
  Chafi, H., McDonald, A., Minh, C. C., Chung, J., Carlstrom, B., Hammond, L., Kozyrakis, C.
  2005

• **RAMP: Research Accelerator for Multiple Processors - A Community Vision for a Shared Experimental Parallel HW/SW Platform** *UC Berkeley Technical Report UCB/CSD-05-1412*
  Asanović, K. A., Chiou, D., Hoe, James, C., Kozyrakis, C., Lu, S., Oskin, M.
  2005

• **Autonomic power management schemes for Internet servers and data centers** *IEEE Global Telecommunications Conference (GLOBECOM 05)*
  Mastroeleon, L., Bambos, N., Kozyrakis, C., Economou, D.
  IEEE.2005: 943–947

• **Improving instruction delivery with a block-aware ISA** *11th International Euro-Par Conference*
  Zmily, A., Killian, E., Kozyrakis, C.
  SPRINGER-VERLAG BERLIN.2005: 530–539

• **Characterization of TCC on chip-multiprocessors** *14th International Conference on Parallel Architectures and Compilation Techniques*
  McDonald, A., Chung, J. W., Chafi, H., Minh, C. C., Carlstrom, B. D., Hammond, L., Kozyrakis, C., Olukotun, K.
  IEEE COMPUTER SOC.2005: 63–74

• **Energy-efficient and high-performance instruction fetch using a block-aware ISA** *International Symposium on Low Power Electronics and Design*
  Zmily, A., Kozyrakis, C.
  ASSOC COMPUTING MACHINERY.2005: 36–41

• **Transactional coherence and consistency: Simplifying parallel hardware and software** *IEEE MICRO*
  Hammond, L., Carlstrom, B. D., Wong, V., Chen, M., Kozyrakis, C., Olukotun, K.
  2004; 24 (6): 92-103

• **Programming with transactional coherence and consistency (TCC)** *11th International Conference on Architectural Support for Programming Languages and Operating Systems*
  Hammond, L., Carlstrom, B. D., Wong, V., Hertzberg, B., Chen, M., Kozyrakis, C., Olukotun, K.
  ASSOC COMPUTING MACHINERY.2004: 1–13
• **Transactional memory coherence and consistency** *31st Annual International Symposium on Computer Architecture*
  IEEE COMPUTER SOC. 2004: 102–113

• **VIRAM-1: A Media-Oriented Vector Processor with Embedded DRAM**
  Gebis, J., William, S., Kozyrakis, C., Patterson, D.
  2004

• **Transactional Memory Coherence and Consistency (TCC)**
  2004

• **Stream Virtual Machine and Two-Level Compilation Model for Streaming Architectures and Languages**
  Mattson, P., Lethin, R., Litvinov, V., Labonte, F., Buck, I., Kozyrakis, C.
  2004

• **The stream virtual machine** *13th International Conference on Parallel Architecture and Compilation Techniques*
  Labonte, F., Mattson, P., Thies, W., Buck, I., Kozyrakis, C., Horowitz, M.

• **Scalable vector processors for embedded systems** *IEEE MICRO*
  Kozyrakis, C. E., Patterson, D. A.
  2003; 23 (6): 36-45

• **Overcoming the limitations of conventional vector processors** *30th Annual International Symposium on Computer Architecture*
  Kozyrakis, C., Patterson, D.
  IEEE COMPUTER SOC. 2003: 399–409

• **Vector vs. superscalar and VLIW architectures for embedded multimedia benchmarks** *35th Annual IEEE/ACM International Symposium on Microarchitecture*
  Kozyrakis, C., Patterson, D.
  IEEE COMPUTER SOC. 2002: 283–293

• **Hardware/compiler codevelopment for an embedded media processor** *PROCEEDINGS OF THE IEEE*
  Kozyrakis, C., Judd, D., Gebis, J., Williams, S., Patterson, D., Yelick, K.
  2001; 89 (11): 1694-1709

• **Hardware/compiler Codevelopment for an Embedded Media Processor**
  Kozyrakis, C., Judd, D., Gebis, J., Williams, S., Patterson, D., Yelick, K.
  2001

• **Lecture Notes in Computer Science**
  edited by Chong, F., Kozyrakis, C., Oskin, M.
  2001

• **Vector IRAM: A Media-oriented Vector Processor with Embedded DRAM** *Technical Record of the 12th Hot Chips Conference*
  Kozyrakis, C., Gebis, J., Martin, D., Williams, S., Mavroidis, I., Pope, S.
  2000

• **Exploiting On-chip Memory Bandwidth in the VIRAM Compiler**
  Judd, D., Yelick, K., Kozyrakis, C., Martin, D., Patterson, D.
  2000

• **Explicitly Parallel Architectures for Memory Performance Enhancement**
  Kozyrakis, C.
  2000

• **Vector IRAM: A Media-oriented Vector Processor with Embedded DRAM**
  Kozyrakis, C., Gebis, J., Martin, D., Williams, S., Mavroidis, I., Pope, S.
  2000
- A Media-Enhanced Vector Architecture for Embedded Memory Systems  
  Technical Report UCB-CSD-99-1059, University of California at Berkeley  
  Kozyrakis, C., Thesis, M., S.  
  1999

- High-Performance Architectures for Embedded Memory Systems  
  Kozyrakis, C.  
  1999

- A new direction for computer architecture research  
  COMPUTER  
  Kozyrakis, C. E., Patterson, D. A.  
  1998; 31 (11): 24-?

- High-Performance Architectures for Embedded Memory Systems  
  Kozyrakis, C.  
  1998

- Scalable processors in the billion-transistor era: IRAM  
  COMPUTER  
  1997; 30 (9): 75-?

- A case for intelligent RAM  
  IEEE MICRO  
  Patterson, D., Anderson, T., Cardwell, N., Fromm, R., Keeton, K., Kozyrakis, C., Thomas, R., Yelick, K.  
  1997; 17 (2): 34-44

- Evaluation of Existing Architectures in IRAM Systems  
  Bowman, N., Cardwell, N., Kozyrakis, C., Romer, C., Wang, H.  
  1997

- Intelligent RAM (IRAM): the industrial setting, applications, and architectures  
  International Conference on Computer Design - VLSI in Computers and Processors (ICCD 97)  
  IEEE COMPUTER SOC. 1997: 2–7

- Intelligent RAM (IRAM): Chips that remember and compute  
  1997 IEEE International Solid-State Circuits Conference  
  Patterson, D., Anderson, T., Cardwell, N., Fromm, R., Keeton, K., Kozyrakis, C., Thomas, R., Yelick, K.  
  IEEE. 1997: 224–225

- The energy efficiency of IRAM architectures  
  24th Annual International Symposium on Computer Architecture  
  Fromm, R., Perissakis, S., Cardwell, N., Kozyrakis, C., Mcgaughy, B., Patterson, D., Anderson, T., Yelick, K.  
  ASSOC COMPUTING MACHINERY. 1997: 327–337

- Pipelined Multi-Queue Management in a VLSI ATM Switch Chip with Credit-Based Flow-Control  
  Kornaros, G., Kozyrakis, C., Vatsolaki, P., Katevenis, M.  
  1997

- Scalable Processors for the Billion Transistors Era: IRAM  
  IEEE Computer  
  Kozyrakis, C., Perissakis, S., Patterson, D., Yelick, K.  
  1997; 30 (9): 75-58

- A Case for Intelligent DRAM: IRAM  
  IEEE Micro  
  Patterson, D., Anderson, T., Cardwell, N., Fromm, R., Keeton, K., Kozyrakis, C.  
  1997; 17 (2): 33-44

- Intelligent RAM (IRAM): the Industrial Setting, Applications, and Architectures  
  Patterson, D., Asanovic, K., Brown, A., Fromm, R., Golbus, J., Gribstad, B., Kozyrakis, C.  
  1997

* Intelligent RAM (IRAM): Chips that Compute and Remember
Patterson, D., Anderson, T., Cardwell, N., Fromm, R., Keeton, K., Kozyrakis, C.
1997

- **The Energy Efficiency of IRAM Architectures**
  Fromm, R., Perissakis, S., Cardwell, N., Kozyrakis, C., McGaughy, B., Patterson, D.
  1997

- **The Architecture, Operation, and Design of the Queue Management Block in the ATLAS I ATM Switch**
  Technical Report FORTH-ICS/TR-172, Institute of Computer Science (ICS), Foundation for Research and Technology (FORTH), Heraklion, Crete, Greece
  Kozyrakis, C., Thesis, B., S.
  1996

- **Plasticine: A Reconfigurable Architecture For Parallel Patterns**
  ISCA '17: 44th International Symposium on Computer Architecture, June 2017
  Prabhakar, R., Zhang, Y., Koeplinger, D., Feldman, M., Zhao, T., Hadjis, S., Pedram, A., Kozyrakis, C., Olukotun, K.
  2017