	$dskarlat@cs.cmu.edu \qquad http://www.cs.cmu.edu/~dskarlat$		
Research Interests	Bridging computer architecture and operating systems, for perform and security. Current focus on the next generation of AI datacent		
Current Position	<b>Carnegie Mellon University</b> Assistant Professor, Computer Science Department	Fall 2021-Present	
Education	University of Illinois at Urbana-Champaign2020PhD in Computer Science2020Advisor: Prof. Josep Torrellas2020Thesis: Rethinking Operating System and Hardware Abstractions for Good & Evil2020David J. Kuck Outstanding PhD Thesis Award4000000000000000000000000000000000000		
	Masters in Computer Science Advisor: Prof. Josep Torrellas Thesis: Opportunistic Power Reassignment between Processor & F David J. Kuck Outstanding MS Thesis Award – GPA: 3.94/4.0	2016 Memory in 3D Stacks	
	Technical University of Crete2014Diploma in Electronic and Computer Engineering, 5-year degree2014Advisor: Prof. Dionisios Pnevmatikatos1000Thesis: Reliable Runtime Architecture for Multiprocessor Systems on Chip1000Limmat Stiftung Foundation Academic Excellence Award1000- GPA: 8.7/10 (Ranked 2nd in class of 2014)1000		
Industry Experience	Meta Research, Menlo Park, CA, USA Visiting Researcher, Core Systems Group	Fall 2020-2023	
Experience	<b>VMware, Palo Alto, CA, USA</b> Research Intern, Performance Engineering Group	Summer & Fall 2018	
	IBM Research, Yorktown Heights, NY, USA Research Intern, Cognitive Systems and Data Centers Group	Summer 2017	
	Intel Labs, Hillsboro, OR, USA Research Intern, Accelerator Architecture Lab	Summer 2015	
	FORTH, Heraklion, GR Research Intern, Computer Architecture and VLSI Lab	Summer 2012	
Paper Awards & Honors	Paper selected as a Communications of the ACM (CACM) Resear Paper selected as an IEEE MICRO Top Picks Best Paper Award at ISCA Paper selected as an IEEE MICRO Top Picks Best Paper Award at ASPLOS Paper selected as an IEEE MICRO Top Picks Paper selected as an IEEE MICRO Top Picks Honorable Mention Best Paper Award at ASPLOS Paper selected as an IEEE MICRO Top Picks Paper selected as an IEEE MICRO Top Picks Paper selected as an IEEE MICRO Top Picks Paper selected as an IEEE MICRO Top Picks	2024 2023 2023 2022 2021 2021 2020 2020	

Awards	CyLab Faculty Award	2025
& Honors	Intel Rising Star Faculty Award	2024
	Linux Foundation Faculty Award	2024
	NSF CAREER Award	2023
	CyLab Faculty Award	2023
	Meta AI System Hardware/Software Codesign Faculty Award	2022
	Meta Security Faculty Award	2022
	Meta Systems Faculty Award	2022
	CyLab Faculty Award	2022
	Meta Academic Spotlight	2021
	Meta Faculty Award	2021
	ACM SIGARCH & IEEE CS TCCA Outstanding Dissertation Award	2021
	David J. Kuck Outstanding PhD Thesis Award, Computer Science Dept., UIUC	2021
	- Awarded to one PhD thesis per year based on quality and impact.	
	Invited to the 8th Heidelberg Laureate Forum	2020
	C.W. Gear Outstanding Graduate Student Award, Computer Science Dept., UIUC	2020
	- Awarded to one graduate student for excellence in research and service.	
	Rising Star in Computer Architecture, Georgia Tech	2019
	Mavis Future Faculty Fellow (MF3), College of Engineering, UIUC	2019
	W.J. Poppelbaum Memorial Award, Computer Science Dept., UIUC	2019
	- For academic merit and creativity in computer architecture.	
	David J. Kuck Outstanding MS Thesis Award, Computer Science Dept., UIUC - Awarded to one MS thesis per year based on quality and impact.	2018
	Academic Achievements Award, Technical Chamber of Greece	2017
	Computer Science Excellence Fellowship, Computer Science Dept., UIUC	2014
	Academic Excellence Award, Limmat Stiftung Foundation, Switzerland	2014
	First place at the ALTERA (Intel) Innovate Europe Contest	2013
	Scholarship of Academic Achievements, School of ECE, TUC	2010
	Academic Excellence Award, Scholarships Foundation of Greece	2008

## Publications Conferences

- 1. Siddharth Jayashankar, Edward Chen, Tom Tang, Wenting Zheng, **Dimitrios** Skarlatos. "Cinnamon: A Framework for Scale-out Encrypted AI." International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), March 2025.
- 2. Tae Hoon Kim, David Rudo, Kaiyang Zhao, Zirui Neil Zhao, **Dimitrios Skar**latos. "Perspective: A Principled Framework for Pliable and Secure Speculation in Operating Systems." International Symposium on Computer Architecture (ISCA), June 2024.
- Ziqi Wang, Kaiyang Zhao, Pei Li, Andrew Jacob, Michael A. Kozuch, Todd C. Mowry, Dimitrios Skarlatos. "Memento: Architectural Support for Ephemeral Memory Management in Serverless Environments." International Symposium on Microarchitecture (MICRO), October 2023.
- Kevin Loughlin, Jonah Rosenblum, Stefan Saroiu, Alec Wolman, Dimitrios Skarlatos, Baris Kasikci. "Siloz: Leveraging DRAM Subarray Groups to Prevent Inter-VM Rowhammer." Symposium on Operating System Principles (SOSP), October 2023.
- 5. Ali Sahraei, Soteris Demetriou, Amirali Sobhgol, Neeraj Pathak, Girish Joshi, Carla Souza, Bo Huang, Wyatt Cook, Andrii Golovei, Pradeep Venkat, Andrew McFague **Dimitrios Skarlatos**, Vipul Patel, Ravinder Thind, Ernesto Gonzalez, Yun Jin, Chunqiang Tang. "XFaaS: Hyperscale and Low Cost Serverless Functions at Meta." Symposium on Operating System Principles (SOSP), October 2023.

- Harshit Saokar, Soteris Demetriou, Nick Magerko, Max Kontorovich, Josh Kirstein, Margot Leibold, **Dimitrios Skarlatos**, Hitesh Khandelwal, Chunqiang Tang.
   "ServiceRouter: Hyperscale and Minimal Cost Service Mesh at Meta." Symposium on Operating Systems Design and Implementation (OSDI), July 2023.
- Kaiyang Zhao, Kaiwen Xue, Ziqi Wang, Dan Schatzberg, Leon Yang, Antonis Manousis, Johannes Weiner, Rik van Riel, Bikash Sharma, Chunqiang Tang, Dimitrios Skarlatos. "Contiguitas: The Pursuit of Physical Memory Contiguity in Datacenters." International Symposium on Computer Architecture (ISCA), 2023. ISCA 2023 Best Paper Award. Selected as an IEEE MICRO Top Picks for the most significant papers from the architecture conferences of 2023.
- Jovan Stojkovic, Namrata Mantri, Dimitrios Skarlatos, Tianyin Xu, Josep Torrellas. "Memory-Efficient Hashed Page Tables." International Symposium on High-Performance Computer Architecture (HPCA), February 2023.
- Johannes Weiner, Niket Agarwal, Dan Schatzberg, Leon Yang, Hao Wang, Blaise Sanouillet, Bikash Sharma, Tejun Heo, Mayank Jain, Chunqiang Tang, Dimitrios Skarlatos. "TMO: Transparent Memory Offloading in Datacenters." International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), March 2022. ASPLOS 2022 Best Paper Award. Communications of the ACM Research Highlight(CACM)
- Tejun Heo, Dan Schatzberg, Andrew Newell, Song Liu, Saravanan Dhakshinamurthy, Iyswarya Narayanan, Josef Bacik, Chris Mason, Chunqiang Tang, Dimitrios Skarlatos. "IOCost: Block IO Control for Containers in Datacenters." International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), March 2022.
   Selected as an IEEE MICRO Top Picks for the most significant papers from the architecture conferences of 2022.
- 11. Jovan Stojkovic, **Dimitrios Skarlatos**, Apostolos Kokolis, Tianyin Xu, Josep Torrellas. "Parallel Virtualized Memory Translation with Nested Elastic Cuckoo Page Tables." International Conference on Architectural Support for Programming Languages and Operating Systems (**ASPLOS**), March 2022.
- 12. Andrew Newell, Dimitrios Skarlatos, Jingyuan Fan, Pavan Kumar, Maxim Khutornenko, Mayank Pundir, Yirui Zhang, Mingjun Zhang, Yuanlai Liu, Linh Le, Brendon Daugherty, Apurva Samudra, Prashasti Baid, James Kneeland, Igor Kabiljo, Dmitry Shchukin, Andre Rodrigues, Scott Michelson, Ben Christensen, Kaushik Veeraraghavan, Chunqiang Tang. "RAS: Continuously Optimized Region-wide Datacenter Resource Allocation." Symposium on Operating System Principles (SOSP), October 2021.
- 13. Ziqi Wang, Michael A. Kozuch, Todd C. Mowry, Vivek Seshadri, Gennady Pekhimenko, Chulhwan Choo, **Dimitrios Skarlatos**. "NVOverlay: Enabling Efficient and Scalable High-Frequency Snapshotting to NVM." International Symposium on Computer Architecture (**ISCA**), June 2021.
- 14. **Dimitrios Skarlatos**, Zirui Neil Zhao, Riccardo Paccagnella, Christopher W. Fletcher, Josep Torrellas. "Jamais Vu: Thwarting Microarchitectural Replay Attacks." International Conference on Architectural Support for Programming Languages and Operating Systems (**ASPLOS**), March 2021.

- 15. Dimitrios Skarlatos, Qingrong Chen, Jianyan Chen, Tianyin Xu, Josep Torrellas. "Draco: Architectural and Operating System Support for System Call Security." International Symposium on Microarchitecture (MICRO), October 2020. Draco has been upstreamed in the mainline Linux Kernel. Draco has been adopted by Android.
- 16. Dimitrios Skarlatos, Umur Darbaz, Bhargava Gopireddy, Nam Sung Kim, Josep Torrellas. "BabelFish: Fusing Address Translations Across the Stack for Containers." International Symposium on Computer Architecture (ISCA), June 2020. Selected as an IEEE MICRO Top Picks for the most significant papers from the architecture conferences of 2020.
- 17. Dimitrios Skarlatos, Apostolos Kokolis, Tianyin Xu, Josep Torrellas. "Elastic Cuckoo Page Tables: Rethinking Virtual Memory Translation for Parallelism." International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), March 2020. ASPLOS 2020 Best Paper Award.

Selected as an IEEE MICRO Top Picks Honorable Mention for the most significant papers from the architecture conferences of 2020.

- Azin Heidarshenas, Serif Yesil, Dimitrios Skarlatos, Adam Morrison, Sasa Misailovic, Josep Torrellas. "Speeding-up Iterative Graph Processing on Shared-Memory with Vertex Merging." International Conference on Supercomputing (ICS), July 2020.
- Dimitrios Skarlatos, Mengjia Yan, Bhargava Gopireddy, Read Sprabery, Josep Torrellas, Christopher W. Fletcher. "MicroScope: Enabling Microarchitectural Replay Attacks." International Symposium on Computer Architecture (ISCA), June 2019.

Selected as an IEEE MICRO Top Picks for the most significant papers from the architecture conferences of 2019.

- 20. Apostolos Kokolis, **Dimitrios Skarlatos**, Josep Torrellas. "PageSeer: Using Page Walks to Trigger Page Swaps in Hybrid Memory Systems." International Symposium on High-Performance Computer Architecture (**HPCA**), February 2019.
- 21. Mengjia Yan, Jiho Choi, **Dimitrios Skarlatos**, Adam Morrison, Christopher W. Fletcher, Josep Torrellas. "InvisiSpec: Making Speculative Execution Invisible in the Cache Hierarchy." International Symposium on Microarchitecture (**MICRO**), October 2018.

Selected as an IEEE MICRO Top Picks Honorable Mention for the most significant papers from the architecture conferences of 2018.

- 22. Bhargava Gopireddy, **Dimitrios Skarlatos**, Wenjuan Zhu, Josep Torrellas. "Het-Core: TFET-CMOS Hetero-Device Architecture for CPUs and GPUs." International Symposium on Computer Architecture (**ISCA**), June 2018.
- 23. Dimitrios Skarlatos, Nam Sung Kim, Josep Torrellas. "PageForge: A Near-Memory Content-Aware Page-Merging Architecture." International Symposium on Microarchitecture (MICRO), October 2017.
- 24. Dimitrios Skarlatos, Renji Thomas, Aditya Agrawal, Shibin Qin, Robert Pilawa, Ulya Karpuzcu, Radu Teodorescu, Nam Sung Kim, Josep Torrellas. "Snatch: Opportunistically Reassigning Power Allocation between Processor and Memory in 3D Stacks." International Symposium on Microarchitecture (MICRO), October 2016.

Publications Journals	<ol> <li>Johannes Weiner, Niket Agarwal, Dan Schatzberg, Leon Yang, Hao Wang, Blaise Sanouillet, Bikash Sharma, Tejun Heo, Mayank Jain, Chunqiang Tang, Dimitrios Skarlatos. "TMO: Transparent Memory Offloading in Datacenters." Communica- tions of the ACM (CACM) Research Highlight, 2025.</li> </ol>
	<ol> <li>Kaiyang Zhao, Kaiwen Xue, Ziqi Wang, Dan Schatzberg, Leon Yang, Antonis Manousis, Johannes Weiner, Rik van Riel, Bikash Sharma, Chunqiang Tang, Dim- itrios Skarlatos. "Contiguitas: The Pursuit of Physical Memory Contiguity in Datacenters." IEEE MICRO Magazine Top Picks from the Computer Ar- chitecture Conferences, Special Issue, May/June 2024.</li> </ol>
	<ol> <li>Tejun Heo, Dan Schatzberg, Andrew Newell, Song Liu, Saravanan Dhakshina- murthy, Iyswarya Narayanan, Josef Bacik, Chris Mason, Chunqiang Tang, Dim- itrios Skarlatos. "IOCost: Block IO Control for Containers in Datacenters." IEEE MICRO Magazine Top Picks from the Computer Architecture Conferences, Special Issue, May/June 2023.</li> </ol>
	4. Dimitrios Skarlatos, Umur Darbaz, Bhargava Gopireddy, Nam Sung Kim, Josep Torrellas. "BabelFish: Fusing Address Translations Across the Stack for Containers." IEEE MICRO Magazine Top Picks from the Computer Architecture Conferences, Special Issue, May/June 2021.
	<ol> <li>Dimitrios Skarlatos, Mengjia Yan, Bhargava Gopireddy, Read Sprabery, Josep Torrellas, Christopher W. Fletcher. "MicroScope: Enabling Microarchitectural Replay Attacks." IEEE MICRO Magazine Top Picks from the Computer Architecture Conferences, Special Issue, May/June 2020.</li> </ol>
Workshop and Technical Reports	1. Dimitrios Skarlatos, Georgios Mantakos, Athanasios Stratikopoulos, Apostolos Dollas. " <i>Real Time Fractal Flame Rendering</i> ." Demo & Poster ALTERA Innovate Europe Contest 2012-2013, International Conference on Field Programmable Logic and Applications (FPL), September 2013. First place, ALTERA Innovate Europe Contest.
	2. <b>Dimitrios Skarlatos</b> , Polyvios Pratikakis, Dionisios Pnevmatikatos. "Towards Reliable Task Parallel Programs." Workshop on Design for Reliability (DFR) in conjunction with HiPEAC, January 2013.
Open	1. Contiguitas, patchset for the Linux Kernel, 2024.
Sourced	2. Jamais Vu, GitHub, 2021.
Software	3. Draco, upstreamed in the Linux Kernel, 2021.
	4. Elastic Cuckoo Hashing, GitHub, 2020.
	5. MicroScope, GitHub, 2019.
	6. InvisiSpec, GitHub, 2018.
U.S Patents	<ol> <li>Lan Vu, Dimitrios Skarlatos, Aravind Bappanadu, Hari Sivaraman, Uday Kurkure, Ravi Soundararajan. "Secure Cloud-based Machine Learning Without Sending Original Data to the Cloud." U.S Patent No 11568257, VMware, Inc., Granted 2023.</li> </ol>

Computer Architecture & Operating Systems (CAOS) Group Advised

Advised	Computer Architecture & Operating Systems (CAOS) Group		
Students	Kaiyang Zhao, PhD, CMU CSD	Fall 2021- Present	
	- Qualcomm Innovation Fellowship Winner 2024		
	Patrick Coppock, co-advised w/ Prof. Mowry PhD, CMU CSD	Fall 2022- Present	
	Siddharth Jayashankar, co-advised w/ Prof. Zheng PhD, CMU CSD		
	Hilbert Chen, CMU ECE	Fall 2023- Present	
	- Qualcomm Innovation Fellowship Winner 2024	1001 2020 11000000	
	Eliot Solomon, co-advised w/ Prof. Mowry PhD, CMU CSD	Fall 2024- Present	
	Vasileios Kypriotis, CMU CSD	Fall 2024 Present	
	Xenia Xu, MS, CMU ECE, Spring 2024-Present	Fall 2024- 1 165610	
		ummer 2023-Present	
	Rene Ravanan, BS, CMU ECE	Spring 2024-Present	
	Giancarlo Zaniolo, BS, CMU ECE	Spring 2024-Present	
		ummer 2024-Present	
	- CRA Outstanding Undergraduate Research Awards Honorable N		
	David Rudo, BS, CMU CSD	Spring 2023-Present	
	- CRA Outstanding Undergraduate Research Awards Honorable N		
	Tae Hoon Kim, BS, CMU CSD	Fall 2021-Present	
	Alumni		
	Ziqi Wang, PhD, co-advised w/ Prof. Mowry, CMU CSD Su	mmer 2021-Fall 2022	
	Kevin Xue, MS, CMU CSD, next PhD at University of Michigan	Fall 2022-Summer	
	2024		
	Balamurugan Marimuthu, MS, CMU ECE, next at SambaNova	Spring-Fall 2022	
		ing 2023-Spring 2024	
		Spring 2023-Fall 2023	
	Andrew Jacob, MS, CMU ECE,	Summer-Fall 2022	
	Pei Li, MS, CMU INI, next at Oracle	Spring-Fall 2022	
		Spring 2023-Fall 2024	
	Sophia Zhang, BS, CMU ECE, next PhD at Princeton	Fall 2022	
		Fall 2021-Spring 2022	
	·	Tall 2021 Spring 2022           Sall 2021-Spring 2022	
	YiFei Zhu, BS w/ Prof. Xu, UIUC, next at Google	Spring 2020-2021	
	Jianyan Chen, MS w/ Prof. Xu, UIUC, next at ByteDance	Spring 2020-2021 Spring 2020	
	Qingrong Chen, MS w/ Prof. Xu, UIUC, next at OpenAI	Fall 2018-2020	
	Maren Dewyze, BS with Prof. Torrellas, UIUC	Spring 2019	
Service	Carnegie Mellon University		
Service	- ACM & SCS Dissertation Awards Committee	2024	
	- CSD PhD Open House	$2024 \\ 2024$	
	- CSD PhD Admissions for Systems	2024	
		Spring 2022 - Present	
	- Panelist on Academic Market	2021,2022	
	Outreach		
	- Gelfand Center course on "Security in a Computer World" Gr		
	$O_{1}$	- J IZ9 F	

- Gelfand Center course on "Security in a Computer World" Grades K3-5

2022

Mentoring

Teaching

- Undergrad Architecture Mentoring Workshop (uArch) Panel "Life after Grad School" 2024

2020 - Present

- Undergrad Architecture Mentoring Workshop (uArch) Mentor 2021, 2022
- Young Architect Workshop (YArch) Mentor/PC 2021, 2022, 2023, 2024
- Meet a Senior Architect (ASPLOS'2021)

**Conference** Organization

- Organizer: YArch 2024, YArch 2023,
- Travel Grants Chair: ASPLOS 2023
- Web Chair: MICRO 2024, MICRO 2023, MICRO 2022,
- Publicity Chair: MICRO 2021, MICRO 2020
- Virtual Arrangements Chair: IISWC 2021
- Program Committee 2020 - Present - ISCA'25, ISCA'24, ISCA'23, ISCA'22, ISCA'21 - MICRO'24 (ERC), MICRO'22 - ASPLOS'23, ASPLOS'22 (ERC), ASPLOS'21 (ERC) - HPCA'22 - SOSP'24 (ERC), SOSP'23 - NSDI'23 - PACT'20 - ISMM'25, ISMM'24 Journal Reviewer 2019 - Present - IEEE MICRO Top Picks 2025 - IEEE MICRO 2024 - IEEE MICRO Top Picks 2022 - ACM Transactions on Computer Systems (TOCS) 2021 - IEEE Computer Architecture Letter (CAL) 2019, 2021 2021 - Present NSF Review Committee - CSR Small Core Panel 2021 Graduate Student Ambassador, Computer Science Dept., UIUC 2016 - 2019 - Served as an ambassador to students recommended for admission. - Assisted with the organization of recruitment events. Graduate Students Admissions Committee, Computer Science Dept., UIUC 2017 - Evaluated prospective student applications - Recommended students to faculty Course Development and Teaching at CMU Experience - Computer Architecture (15-740) Spring 2025 - Parallel Computer Architecture and Programming (15-418/15-618) Fall 2024 - Secure Computer Systems (15-793) Spring 2024 - Parallel Computer Architecture and Programming (15-418/15-618) Fall 2023 - Security for Software and Hardware Systems (15-799) Spring 2023 - Parallel Computer Architecture and Programming (15-418/15-618) Fall 2022 – Datacenter Computing (15-849) Fall 2021 Teaching Assistant
  - Parallel Computer Architectures (UIUC CS533) Spring 2020 - Parallel Computer Architectures (UIUC CS533) Spring 2019

- Advanced Operating Systems (UIUC CS523)
   Secure Processor Design (UIUC CS598)
  - Parallel Computer Architectures (UIUC CS533)

- Computer System Organization (UIUC CS433)

Fall 2019 Fall 2019 Spring 2018 Fall 2015

## Research Jan'25 CyLab, Faculty Award, 50K, PI, num PIs: 2 Funding Title: Scale-Out Encrypted LLMs on GPUs

- Aug'24 Linux Foundation, \$50K PI, num PIs: 1 Title: Learned virtual memory with eBPF.
- Aug'24 Intel, \$50K PI, num PIs: 1 Title: Intel Rising Star Faculty Award 2024
- Feb'24 Oracle Labs, \$100K/50K, co-PI, num PIs: 2 Title: Efficient Virtualization of Serverless Functions
- Jan'24 Ampere Computing, \$25K, PI, num PIs: 1 Title: Server donation, four Ampere Mt. Collins 2U24 NVMe L6 MP platforms
- April'23 NSF CAREER, 587K, PI, num PIs: 1 Title: Rebuilding the Virtual Memory Abstraction Across Hardware and Operating Systems
  - Jan'23 CyLab, Faculty Award, 50K, PI, num PIs: 2 Title: Scale-out Hardware Architecture for Privacy-Preserving Computing
- Oct'22 Intel SRS, 375K, PI, num PIs: 1 Title: Rebuilding Virtual Memory for Heterogeneous Architectures
- Sep'22 Meta, AI Hardware/Software Codesign Faculty Award, 50K, PI, num PIs: 1 Title: OS and Hardware Support for Multi-tenant Inference on Heterogeneous Compute
- Sep'22 Meta, Security Faculty Award, 100K, PI, num PIs: 1 Title: A Secure Speculative Execution Abstraction Across the OS and Hardware
- Sep'22 Meta, Systems Faculty Award, 50K, PI, num PIs: 1Title: Redesigning Virtual Memory Management for the Datacenter
- Jun'22 NSF, CCF PPoSS 2217016, 5M/550K, co-PI, num PIs: 9 Title: A Full-Stack Architecture for Sparse Computation
- May'22 NSF, REU CNS Core 2107307 Supplement, 16K, co-PI, num PIs: 2
- Feb'22 CyLab, Faculty Award, 50K, PI, num PIs: 1 Title: A Secure Speculative Execution Abstraction Across Hardware and Software
- Sep'21 Meta, Faculty Award, 50K, PI, num PIs: 1 Title: Flexible and Efficient Huge Pages for Containers
- Jun'21 NSF, CNS 2107307, 600K/300K, co-PI, num PIs: 2 Title: Secure Hardware Virtualization Contexts for Ephemeral Cloud Computing