

# Alexandros DAGLIS

ScD, Computer Science  
Assistant Professor in Computer Science, Georgia Institute of Technology

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## RESEARCH INTERESTS

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Computer architecture, datacenter systems, hardware-software co-design

## EDUCATION

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- 2012–2018 Doctor of Science degree in COMPUTER SCIENCE  
**École Polytechnique Fédérale de Lausanne (EPFL)**, Lausanne, Switzerland  
Thesis: “Network-compute co-design for distributed in-memory computing”  
Advisors: Prof. Babak FALSAFI & Prof. Edouard BUGNION
- 2007–2012 Diploma in ELECTRICAL & COMPUTER ENGINEERING (5-year degree)  
**National Technical University of Athens (NTUA)**, Athens, Greece  
Thesis: “A study of a dynamic placement policy in a NUCA cache”  
Advisor: Prof. Nectarios KOZIRIS

## AWARDS & HONORS

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- Spring 2024 [ASPLOS 2024 Distinguished Reviewer](#).
- Fall 2023 NSF CAREER Award.
- Fall 2023 Georgia Tech Student Recognition of Excellence in Teaching.
- Fall 2022 Georgia Tech College of Computing Outstanding Junior Faculty Teaching Award.
- Fall 2022 Georgia Tech Student Recognition of Excellence in Teaching.
- Fall 2021 Georgia Tech Student Recognition of Excellence in Teaching.
- 2019 Google Faculty Research Award.
- 2019 ACM SIGARCH/IEEE CS TCCA Outstanding Dissertation – Honorable Mention for “contributions to network-centric server architecture for in-memory data-center services”.
- 2018 Nominated for an ACM Doctoral Dissertation Award by EPFL’s School of Computer and Communication Sciences.
- 2018 EPFL remarkable thesis distinction. Awarded to top 8% of PhD dissertations.
- 2013–2014 Microsoft Research Fellowship.
- 2012–2013 EPFL Computer Science Fellowship.

## RESEARCH FUNDING

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- 2024 NSF award 2333049—SHF: *Small: Redesigning the Memory System in the Era of CXL*
- 2023 NSF CAREER—*Architecting Datacenters for Optimized Tail Latency at Scale*
- 2023 Samsung Semiconductor Inc—*Rethinking Server Memory Hierarchy in the Era of CXL*.

- 2022 IARPA AGILE—*Scalable Locally-Centric Graph Analytics System*.
- 2022 NSF award 2212098—*Collaborative Research: CNS Core: Medium: High-performance Network Stacks for the Edge*.
- 2022 Intel Corporation—*TRIM: Architecting Systems for Terascale in-Memory Applications*.
- 2021 Samsung Semiconductor Inc—*Disaggregated Memory Architectures for Scalable Distributed Training*.
- 2020 NSF award 2006602—*SHF: CNS Core: Small: Server architecture optimizations for microsecond-scale RPCs*.

## EMPLOYMENT

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JAN. '19–PRESENT	Assistant Professor at School of Computer Science, College of Computing, Georgia Institute of Technology
SEP. '12–SEP. '18	Research Assistant at EPFL, Lausanne, Switzerland Research on Datacenter Technologies and In-Memory Rack-scale Computing <ul style="list-style-type: none"> <li>• Lead architect of the <b>Scale-Out NUMA</b> project.</li> </ul>
JAN.–MAY '15	Systems Research Intern at HP LABS, Palo Alto, USA Software and hardware research for HP's <i>The Machine</i>

## TEACHING

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- Grad Studies-Computing (cs7001) Fall 2024
- Systems and Networks (cs2200) Spring 2022, Spring 2023
- Advanced Computer Architecture Fall 2020, Fall 2021, Fall 2022, Fall 2023  
(cs4290/6290/ece4100/6100)
- Topics on Datacenter Design (cs8803) Fall 2019, Spring 2020, Spring 2021

## CONFERENCE PUBLICATIONS

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- [1] Albert Cho, Alexandros Daglis. **StarNUMA: Mitigating NUMA Challenges with Memory Pooling**. In Proceedings of the *57th IEEE/ACM International Symposium on Microarchitecture (MICRO)*, Austin, TX, USA, 2024. (Acceptance rate: 22.7%)
- [2] Albert Cho, Anish Saxena, Moinuddin Qureshi, Alexandros Daglis. **CXL-Centric Memory System for Scalable Servers**. In Proceedings of the *International Conference for High Performance Computing (SC'24)*, Atlanta, GA, USA, 2024. (Acceptance rate: 22.7%)
- [3] Anirudh Jain, Divya Kiran Kadiyala, Alexandros Daglis. **Safety Hints for HTM Capacity Abort Mitigation**. In Proceedings of the *29th IEEE International Symposium on High-Performance Computer Architecture (HPCA-29)*, Montreal, Canada, 2023. (Acceptance rate: 25%)

- [4] Hamed Seyedroudbari, Srikar Vanavasam, Alexandros Daglis. **Turbo: SmartNIC-enabled Dynamic Load Balancing of  $\mu$ s-scale RPCs.** In *Proceedings of the 29th IEEE International Symposium on High-Performance Computer Architecture (HPCA-29)*, Montreal, Canada, 2023. (Acceptance rate: 25%)
- [5] Mark Sutherland, Babak Falsafi, Alexandros Daglis. **Cooperative Concurrency Control for Write-Intensive Key-Value Workloads.** In *Proceedings of the 28th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS-XXVIII)*, Vancouver, Canada, 2023. (Acceptance rate: 25%)
- [6] Marina Vemmou, Albert Cho, Alexandros Daglis. **Patching up Network Data Leaks with Sweeper.** In *Proceedings of the 55th IEEE/ACM International Symposium on Microarchitecture (MICRO)*, Chicago, IL, USA, 2022. (Acceptance rate: 23%)
- [7] Enrique Saurez, Harshit Gupta, Alexandros Daglis, Umakishore Ramachandran. **OneEdge: An Efficient Control Plane for Geo-Distributed Infrastructures.** In *Proceedings of the ACM Symposium on Cloud Computing (SoCC)*, Seattle, WA, USA, 2021. (Acceptance rate: 32%)
- [8] Marina Vemmou and Alexandros Daglis. **COSPlay: Leveraging Task-Level Parallelism for High-Throughput Synchronous Persistence.** In *Proceedings of the 54th IEEE/ACM International Symposium on Microarchitecture (MICRO)*, Worldwide Event, 2021. (Acceptance rate: 22%)
- [9] Arash Pourhabibi, Mark Sutherland, Alexandros Daglis, Babak Falsafi. **Cerebros: Evading the RPC Tax in Datacenters.** In *Proceedings of the 54th IEEE/ACM International Symposium on Microarchitecture (MICRO)*, Worldwide Event, 2021. (Acceptance rate: 22%)
- [10] Mark Sutherland, Siddharth Gupta, Babak Falsafi, Virendra Marathe, Dionisios Pnevmatikatos, Alexandros Daglis. **The NeBuLa RPC-Optimized Architecture.** In *Proceedings of the 47th International Symposium on Computer Architecture (ISCA)*, Worldwide Event, 2020. (Acceptance rate: 18%)
- [11] Siddharth Gupta, Alexandros Daglis, Babak Falsafi. **Distributed Logless Atomic Durability with Persistent Memory.** In *Proceedings of the 52nd International Symposium on Microarchitecture (MICRO)*, Columbus, OH, USA, 2019. (Acceptance rate: 23%)
- [12] Alexandros Daglis, Mark Sutherland, Babak Falsafi. **RPCValet: NI-Driven Tail-Aware Balancing of  $\mu$ s-scale RPCs.** In *Proceedings of the 24th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS-XXIV)*, Providence, RI, USA, 2019. (Acceptance rate: 21%)
- [13] Dmitrii Ustiugov, Alexandros Daglis, Javier Picorel, Mark Sutherland, Edouard Bugnion, Babak Falsafi, Dionisios Pnevmatikatos. **Design Guidelines for High-Performance SCM Hierarchies.** In *Proceedings of the 4th Annual International Symposium on Memory Systems (MEMSYS)*, Washington DC, USA, 2018.
- [14] Mario Drumond, Alexandros Daglis, Nooshin Mirzadeh, Dmitrii Ustiugov, Javier Picorel, Babak Falsafi, Boris Grot, Dionisios Pnevmatikatos. **The Mondrian Data Engine.** In *Proceedings of the 44th International Symposium on Computer Architecture (ISCA)*, Toronto, ON, Canada, 2017. (Acceptance rate: 17%)
- [15] Stanko Novakovic, Alexandros Daglis, Edouard Bugnion, Babak Falsafi, Boris Grot. **The Case for RackOut: Scalable Data Serving Using Rack-Scale Systems.** In *Proceedings of the ACM Symposium on Cloud Computing (SoCC)*, Santa Clara, CA, USA, 2016. (Acceptance rate: 25%)

- [16] Alexandros Daglis, Dmitrii Ustiugov, Stanko Novakovic, Edouard Bugnion, Babak Falsafi, Boris Grot. **SABRes: Atomic Object Reads for In-Memory Rack-Scale Computing**. In Proceedings of the *49th International Symposium on Microarchitecture (MICRO)*, Taipei, Taiwan, 2016. (Acceptance rate: 21%)
- [17] Stanko Novakovic, Alexandros Daglis, Edouard Bugnion, Babak Falsafi, Boris Grot. **An Analysis of Load Imbalance in Scale-out Data Serving**. *ACM SIGMETRICS* (Short paper), Antibes Juan-Les-Pins, France, 2016.
- [18] Alexandros Daglis, Stanko Novakovic, Edouard Bugnion, Babak Falsafi, Boris Grot. **Manycore Network Interfaces for In-Memory Rack-Scale Computing**. In Proceedings of the *42nd International Symposium on Computer Architecture (ISCA)*, Portland, OR, USA, 2015. (Acceptance rate: 19%)
- [19] Stanko Novakovic, Alexandros Daglis, Edouard Bugnion, Babak Falsafi, Boris Grot. **Scale-Out NUMA**. In Proceedings of the *19th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS-XIX)*, Salt Lake City, UT, USA, 2014. (Acceptance rate: 23%)

## JOURNAL PUBLICATIONS

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- [20] Mohammad Alian, Jongmin Shin, Ki-Dong Kang, Ren Wang, Alexandros Daglis, Dae-hoon Kim, Nam Sung Kim. **IDIO: Orchestrating Inbound Network Data on Server Processors**. *IEEE Computer Architecture Letters*, 2020.
- [21] Phillip Stanley-Marbell, Armin Alaghi, Michael Carbin, Eva Darulova, Lara Dolecek, Andreas Gerstlauer, Ghayoor Gillani, Djordje Jevdjic, Thierry Moreau, Mattia Cacciotti, Alexandros Daglis, Natalie Enright Jerger, Babak Falsafi, Sasa Misailovic, Adrian Sampson, Damien Zufferey. **Exploiting Errors for Efficiency**. *ACM Computing Surveys*, 2020.
- [22] Stanko Novakovic, Alexandros Daglis, Dmitrii Ustiugov, Edouard Bugnion, Babak Falsafi, Boris Grot. **Mitigating Load Imbalance in Distributed Data Serving with Rack-Scale Memory Pooling**. *ACM Transactions on Computer Systems (TOCS)*, 2019.
- [23] Mario Drumond, Alexandros Daglis, Nooshin Mirzadeh, Dmitrii Ustiugov, Javier Picorel, Babak Falsafi, Boris Grot, Dionisios Pnevmatikatos. **Algorithm/Architecture Co-Design for Near-Memory Processing**. *ACM SIGOPS Operating Systems Review*, 2018.

## WORKSHOP PUBLICATIONS, ARTICLES & ARXIV PUBLICATIONS

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- [24] Prachatos Mitra, Alexandros Daglis. **Filtering Wasteful Vertex Visits in Breadth-First Search**. In Proceedings of the *SC '23 Workshops of The International Conference on High Performance Computing, Network, Storage, and Analysis (SC-W)*, 2023.
- [25] Albert Cho, Anish Saxena, Moinuddin Qureshi, Alexandros Daglis. **A Case for CXL-Centric Server Processors**. <https://arxiv.org/abs/2305.05033>, May 2023.
- [26] Taekyung Heo, Saeed Rashidi, Changhai Man, Divya Kiran Kadiyala, William Won, Sudarshan Srinivasan, Midhilesh Elavazhagan, Madhu Kumar, Alexandros Daglis, Tushar Krishna. **Exploring Memory Expansion Designs for Training Mixture-of-Experts Models**. *Workshop on Hot Topics in System Infrastructure (HotInfra)*, 2023.
- [27] Anirudh Sarma, Hamed Seyedroudbari, Harshit Gupta, Umakishore Ramachandran, Alexandros Daglis. **NFSlicer: Data Movement Optimization for Shallow Network Functions**. <https://arxiv.org/abs/2203.02585>, March 2022.

- [28] Joy Arulraj, Abhijit Chatterjee, Alexandros Daglis, Ashutosh Dhekne, and Umakishore Ramachandran. **eCloud: A Vision for the Evolution of the Edge-Cloud Continuum.** *IEEE Computer, Special Issue on Computing for Autonomy: Latency, Power, Resilience*, May 2021.
- [29] Siddharth Gupta, Alexandros Daglis, Babak Falsafi. **Unleashing the Full Potential of Persistent Memory with Logless Atomic Durability.** *11th Annual Non-Volatile Memories Workshop*, 2020.

## INVITED TALKS

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<b>CXL-based Memory Systems for Servers</b>	
• NTU-Imperial Cloud Systems Workshop	June 2024
<b>A Case for CXL-Centric Server Processors</b>	
• Microsoft Azure Hardware Architecture AHA Learning Series	October 2023
<b>Architecting Systems for Terascale in-Memory Applications</b>	
• Intel Center for Transformative Server Architectures (TSA) Annual Workshop	September 2023
<b>Rethinking the Network-Compute Interface in the era of extreme software decomposition</b>	
• University of Washington	March 2023
<b>A decade of Scale-Out NUMA: Impact on my PhD, early career, and research community</b>	
• Babak Falsafi's 25-year Career Anniversary Workshop	February 2023
<b>Efficient Large-Scale Architectures for Distributed Training Using Memory Expansion Techniques</b>	
• Samsung Memory Solutions Lab	May 2022
<b>Optimizing the "Last Mile" with Network-Compute Co-Design</b>	
• Center for Research into Novel Computing Hierarchies (CRNCH) Summit	Jan. 2021
<b>Network/Architecture CoDesign</b>	
• <i>Happy Hour with Architects</i> online series, hosted by Samira Khan	May 2020
<b>RPCValet: NI-Driven Tail-Aware Balancing of <math>\mu</math>s-scale RPCs</b>	
• 24th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS-XXIV), Providence, RI, USA (conference presentation)	Apr. 2019
<b>Network-Centric Computing for Online Services</b>	
• CS seminar at Stony Brook University	Sep. 2019
• ECE seminar at the National Technical University of Athens (NTUA)	Sep. 2018
• CS research seminar at Imperial College London	Apr. 2018
• CIS seminar at the University of Pennsylvania	Mar. 2018
• EE departmental seminar at Princeton University	Mar. 2018
• CS research seminar at Rutgers University	Mar. 2018
• CS research seminar at UCLA	Feb. 2018
• SCS seminar at Georgia Tech	Feb. 2018
<b>SABRes: Atomic Object Reads for In-Memory Rack-Scale Computing</b>	

<ul style="list-style-type: none"> <li>49th International Symposium on Microarchitecture (MICRO), Taipei, Taiwan (conference presentation)</li> </ul>	Oct. 2016
<b>Chip Design for In-Memory Rack-Scale Computing</b> <ul style="list-style-type: none"> <li>EcoCloud Annual Event, Lausanne, Switzerland</li> </ul>	May 2016
<b>Manycore Network Interfaces for In-Memory Rack-Scale Computing</b> <ul style="list-style-type: none"> <li>Computing Systems Research Day at the National Technical University of Athens (NTUA), Athens, Greece</li> </ul>	Jan. 2016
<ul style="list-style-type: none"> <li>42nd International Symposium in Computer Architecture (ISCA), Portland, USA (conference presentation)</li> </ul>	Jun. 2015
<b>Hybrid Coherence for “The Machine”</b> <ul style="list-style-type: none"> <li>HP Labs, Palo Alto, USA</li> </ul>	May 2015

## PROFESSIONAL SERVICE

### PC MEMBER / REVIEWER:

- Conference Program Committee: ISCA 2024, ASPLOS 2024, ASPLOS 2023, ISCA 2022 Industry Track, HPCA 2022, ASPLOS 2021, USENIX ATC 2021, USENIX ATC 2020, ISPASS 2020, CLUSTER 2019
- Conference External Review Committee: MICRO 2024, ISCA 2023, ISCA 2021, ISCA 2020, MICRO 2020
- Journals: IEEE MICRO 2024, CAL 2021, CAL 2020, IEEE Transactions on Computers 2018/2023, TACO 2019
- Workshops: YArch 2024, HotInfra 2023, YArch 2022, WAX 2019, WORD 2019
- Other: MICRO Student Research Competition 2023 & 2019

### ORGANIZATIONAL ROLES:

- MICRO Artifact Evaluation Co-Chair, 2022
- ASPLOS-XXVII Travel Grants Chair, 2022
- [Young Architect \(YArch\)](#) Workshop co-organizer, 2021 (at ASPLOS-XXVI)
- [Young Architect \(YArch\)](#) Workshop co-organizer and PC chair, 2020 (at ASPLOS-XXV)
- [Rising Stars in Computer Architecture \(RISC-A\)](#) Workshop co-organizer, 2019

### RESEARCH PROPOSAL EVALUATIONS:

- NSF proposal ad hoc reviewer, 2024
- Israel Science Foundation reviewer, 2023
- NSF proposal review panelist, 2019
- NASA reviewer, 2019

## MENTORING

<b>PhD</b>	Prachatos Mitra	2023-
	Albert Cho	2021-
	Marina Vemmou	2019-

	Hamed Seyedroudbari	2019-
	Divya Kadiyala	2019-
	Mark Sutherland (w/ Babak Falsafi)	2018-2022
<b>MS</b> <b>(research project)</b>	Ali Asgar	2024
	Nikhil Boopalam	2024
	Manish Dash	2024
	Shreyan Jabade	2024
	Peidi Song	2023-2024
	Anand Naik	2023-
	Prashant Ramnani	2023-
	Rachana Aithal	2023-
	Vivek Singh	2023-
	Dhruva Devasthale	2023
	Manish Manchali	2023
	Sibi Sudhakar	2023
	Jayant Tandon	2023
	Aditya Rohan	2022
	Balaji Ravikumar	2022
	Nagasayee Guduru	2022
	Harigovind Anil	2022
	Dhruva Barfiwala	2022
	Arvind Sivasankar	2022
	Sriyash Caculo	2021-2022
<b>BS</b> <b>(thesis)</b>	Srikar Vanavasam	2022-2023

## PATENTS

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- [1] *Atomic Object Reads for In-Memory Rack-Scale Computing* | US Patent 10,929,174, 2021
  - With Boris Grot and Babak Falsafi.
- [2] *Scale-Out Non-Uniform Memory Access* | US Patent 9,734,063, 2017
  - With Stanko Novakovic, Boris Grot, Edouard Bugnion, and Babak Falsafi.
  - Licensed by a major IT vendor in 2016.

## LANGUAGES

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GREEK, ENGLISH, GERMAN (limited working proficiency), FRENCH (elementary proficiency).