Soramichi Akiyama, Ph.D.

Associate Professor (JP: 准教授), Security and Network Course,
College of Information Science and Engineering, Ritsumeikan University

+ Short Bio

I received my Ph.D. from Department of Creative Informatics, The University of Tokyo in 2015, after obtaining a B.Eng. from Kyoto University in 2010. Since April 2022, I have been an associate professor at College of Information Science and Engineering, Ritsumeikan University. Before that, I experienced an internship in Microsoft Research and then worked for Nippon Telegraph and Telephone (NTT), National Institute of Advanced Industrial Science and Technology (AIST), and The University of Tokyo. My research interest centers on how to efficiently execute large scale workloads in the AI and HPC fields with as little programmer effort as possible, by leveraging knowledge of operating systems, virtualization techniques, memory systems, and performance analysis.

+ General Info

Office Address	2-150 Iwakuracho, Ibaraki, Osaka 567-8570, Japan
Email	✉ s-akym [at] fc.ritsumei.ac.jp
Web	http://www.soramichi.jp/
Research Interest	Operating Systems, Virtualization Techniques, Memory Systems, Performance Analysis
Languages	Japanese (native), English (very fluent)

+ Full-time Working Experiences

2022/04 – Today	**Associate Professor**, College of Information Science and Engineering, Ritsumeikan University
2018/06 – 2022/03	**Assistant Professor**, Department of Creative Informatics, The University of Tokyo
2015/11 – 2018/05	**Researcher**, Artificial Intelligence Research Center, National Institue of Advanced Industrial Science and Technology (AIST) *I was a postdoc for a month, then worked as a researcher*
2015/04 – 2015/10	**Researcher**, Software Innovation Center, Nippon Telegraph and Telephone (NTT)

+ Other Experiences

2021/04 – 09, 2020/04 – 09	**External Lecturer**, Graduate School of Science and Technology for Future Life, Tokyo Denki University (Teaching: "Functions and Structures of Operating Systems")
2018/10 – 2020/09	**Technical Advisor**, i Smart Technologies (part-time consulting job)
2019/04 – 2019/10	**Academic Guest,** Department of Computer Science, ETH Zürich, Switzerland
2013/04 – 2015/03	**JSPS Research Fellow DC2**, Japan Society for Promotion of Science
2013/05 – 2013/08	**Research Intern**, Microsoft Research, Redmond, WA, US
2011/07 – 2011/08	**Intern**, Information Technology Research Institute, National Institue of Advanced Industrial Science and Technology (AIST), Japan

+ Education

2015/03	Ph.D., Department of Creative Informatics, The University of Tokyo, Japan
2012/03	M.Sc., Department of Creative Informatics, The University of Tokyo, Japan
2010/03	B.Eng., School of Informatics and Mathematical Science, Kyoto University, Japan

+ Academic Services

LA Chair	15th ACM SIGOPS Asia-Pacific Workshop on Systems (APSys'24)
Mentor	JST Global Science Campus Experts in Information Science (2022/04 -)
Editorial Board Member	IPSJ Transactions on Advanced Computing Systems (ACS) (2021/04 - 2024/03)

Ph.D. Forum Chair	39th IEEE International Symposium on Reliable Distributed Systems (SRDS'20)
Associate Editor	IEICE Transactions on Information and Systems (2019/06 – 2023/05)
PC Member	ACM CF'20, SRDS'19, MCSoC'18 (Track 8), xSIG'22, xSIG'23, xSIG'24
Mentor	The First Young Architect Workshop (Yarch), co-located with HPCA'19
Program Co-Chair	The 7th IEEE Non-Volatile Memory Systems and Application Symposium (NVMSA'18)
Publicity (Co-)Chair	APSys'20, EuroSys'18, SRDS'18
Committee Member	Special Interest Group on Operating Systems, Information Processing Society of Japan (2017/04 – 2021/03, 2022/04 –), Special Interest Group on System Architecture, Information Processing Society of Japan (2022/04 -)
External Reviewer	The Journal of Supercomputing (2023), International Journal on Engine Research (2020), IEEE TDSC (2020), IEEE TCC (2017, 2016, 2015), IEICE Trans. on Information and Systems (2019, 2018), IEICE Trans. on Communications (2018, 2017), ISCC'19, NVMSA'17, eScience'17

+ Awards and Honors

2024/06	IPSJ Outstanding Paper Award
2022/01	IPSJ SIGARC Young Researcher Award
2020/09	Excellent Presentation Award, IEICE Technical Committee on Computer Systems (CPSY)
2019/03	Excellent Presentation Award, IEICE Technical Committee on Computer Systems (CPSY)
2018/08	Computer Science Research Award for Young Scientists, Information Processing Society of Japan
2015/06	Endorsement to my Ph.D. thesis by IPSJ Special Interest Group on Operating Systems
2015/03	Dean's Award, Graduate School of Information Science and Technology, The University of Tokyo
2013/04 - 2015/03	Research Fellowship for Young Scientists, Japan Society for the Promotion of Science (JSPS)
2012/07	Computer Science Research Award for Young Scientists, Information Processing Society of Japan
2011/12	Best Paper Award, 23rd Computer Systems Symposium (ComSys'11)
2011/12	Best Student Poster Award, 23rd Computer Systems Symposium (ComSys'11)

+ Grants (PI)

2022/10 - 2026/03	PRESTO, Strategic Basic Research Programs, Japan Science and Technology Agency
2020/04 - 2022/03	ACT-I (Accelerarion Phase), Strategic Basic Research Programs, Japan Science and Technology Agency, 13000 K JPY
2018/10 - 2020/03	ACT-I, Strategic Basic Research Programs, Japan Science and Technology Agency, 3000 K JPY
2013/04 - 2015/03	Grant-in-Aid for JSPS Research Fellow, Japan Society for the Promotion of Science, 2000 K JPY

+ Refereed Publications

[IPSJ Journal-2]	木村 悠生, 穐山 空道, 猪俣 敦夫, 上原 哲太郎: "Onion サイトの HTTP レスポンスを用いたダークウェブの大規模分析", 情報処理学会論文誌, Vol. 66, No. 3, pp. ? - ?, 2025 (to appear).
[IOTS'24]	吉田 純一, 穐山 空道: "分散型ネーミングサービス Handshake に登録されたドッペルゲンガードメインの定量的調査", 第 17 回 インターネットと運用技術シンポジウム (IOTS 2024), pp. 41 - 48, December 2024.
[IPSJ Journal-1]	星名 藍乃介, 穐山 空道, 上原 哲太郎: "32bit を超える time_t 型をもつ環境における 2038 年問題とその検出", 情報処理学会論文誌, Vol. 65, No. 9, pp. 1387 - 1398, September 2024.
[DRAMSec'24]	K. Yoshioka, S. Akiyama: "GbHammer: Malicious Inter-process Page Sharing by Hammering Global Bits in Page Table Entries", Fourth Workshop on DRAM Security, pp. 1 - 7, June 2024. *Co-located with ISCA
[ISQED'24]	S. Akiyama, R. Shioya, Y. Miyatake, T. Yang: "Error Distribution Estimation for Fixed-point Arithmetic using Program Derivatives", The 25th International Symposium on Quality Electronic Design, pp. 1 - 9, April 2024.
[QRS-C'23]	Y. Kimura, S. Akiyama, A. Inomata, T. Uehara: "On Collecting Onion Server Fingerprints and Identification of Their Operators", The 23rd IEEE International Conference on Software Quality, Reliability, and Security Companion, pp. 540 - 548, October 2023.

[IPSJ Trans ACS-2] 穐山 空道, 山田 淳二, 塩谷 亮太: "DRAM の設計余裕を活用した低レイテンシ化・低消費電力化手法とその制御法の研究動向", 情報処理学会論文誌コンピューティングシステム, Vol. 16, No. 1, pp. 14 - 28, 2023.

[QRS'22] K. Yoda, T. Nakamaru, S. Akiyama, S. Chiba: "An Anomaly-based Approach for Detecting Modularity Violations on Method Placement", The 22nd IEEE International Conference on Software Quality, Reliability, and Security, pp. 287 - 298, December 2022.

[JSAE] 花俣 槇一, 穐山 空道, 平田 光男: "ニューラルネットワークを用いた走行抵抗係数推定とそのFPGA による低消費電力実装", 自動車技術会論文集, Vol. 53, No. 3, pp. 605 - 610, May2022.

[ICPE'21] S. Akiyama, R. Shioya: "The Granularity Gap Problem: A Hurdle for Applying Approximate Memory to Complex Data Layout", 12th ACM/SPEC International Conference on Performance Engineering, pp. 125 - 132, April 2021.

[MASCOTS'20] C. Helm, S. Akiyama, K. Taura: "Reliable Reverse Engineering of Intel DRAM Addressing Using Performance Counters", IEEE International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems, pp. 1 – 8, 2020. *Cited more than 10 times*

[MSR'20] T. Nakamaru, T. Matsunaga, T. Yamazaki, S. Akiyama, S. Chiba: "An Empirical Study of Method Chaining in Java", The 17th International Conference on Mining Software Repositories, pp. 1 – 10, 2020. *Cited more than 10 times*

[SPMA'20] S.Akiyama: "Assessing Impact of Data Partitioning for Approximate Memory in C/C++ Code", The 10th Workshop on Systems for Post-Moore Architectures, pp. 1 – 7, 2020. *Co-located with EuroSys'20*

[IEICE Trans-2] S, Akiyama: "A Lightweight Method to Evaluate Effect of Approximate Memory with Hardware Performance Monitors", IEICE Transactions on Information and Systems, Vol. E102-D, No. 12, pp. 2354 - 2365, 2019.

[IPDPSW'18] S, Akiyama, T. Hirofuchi, R. Takano: "Diagnosing Performance Fluctuations of High-throughput Software for Multi-core CPUs", 32nd IEEE International Parallel and Distributed Processing Symposium Workshops, pp. 1293 – 1302, 2018.

[SFMA'18] S. Hamada, S. Akiyama, M. Namiki: "Reactive NaN Repair for Applying Approximate Memory to Numerical Applications", The 8th Workshop on Systems for Multi-core and Heterogeneous Architectures , pp. 1 – 6, 2018. *Co-located with EuroSys'18*

[NVMSA'17] A. Koshiba, T. Hirofuchi, S. Akiyama, R. Takano, M. Namiki: "Towards Write-back Aware Software Emulator for Non-Volatile Memory", The 6th IEEE Non-Volatile Memory Systems and Applications Symposium, pp. 1 – 6, 2017. *Cited more than 10 times*

[ROSS'17] S. Akiyama, T. Hirofuchi: "Quantitative Evaluation of Intel PEBS Overhead for Online System-Noise Analysis", 7th International Workshop on Runtime and Operating Systems for Supercomputers, pp. 3:1 – 3:8, 2017. *Co-located with HPDC'17* *Cited more than 30 times*

[IEICE Trans-1] S. Akiyama, T. Hirofuchi, R. Takano, S. Honiden: "Fast Live Migration for IO-Intensive VMs with Parallel and Adaptive Transfer of Page Cache via SAN", IEICE Transactions on Information and Systems, Vol. E99-D, No. 12, pp. 3024 – 3034, 2016.

[CloudCom'16] S. Akiyama, T. Hirofuchi, H. Ogawa: "Performance Prediction of Memory Access Intensive Apps with Delay Insertion: A Vision", 8th IEEE International Conference on Cloud Computing Technology and Science, pp. 492 – 496, 2016.

[EuroSys'16] A. Newell, G. Kliot, I. Menache, A. Gopalan, S. Akiyama, M. Silberstein: "Optimizing Distributed Actor Systems for Dynamic Interactive Services", The European Conference on Computer Systems, pp. 38:1 – 38:15, 2016. *Cited more than 20 times*

[CloudCom'14] S. Akiyama, T. Hirofuchi, S. Honiden: "Evaluating Impact of Live Migration on Data Center Energy Saving", 6th IEEE International Conference on Cloud Computing Technology and Science, pp. 759 – 762, 2014.

[IEEE CLOUD'14] S. Akiyama, T. Hirofuchi, R. Takano, S. Honiden: "Fast Live Migration with Small IO Performance Penalty by Exploiting SAN in Parallel", The 2014 IEEE 7th International Conference on Cloud Computing, pp. 40 – 47, 2014.

[CCGrid'13] S. Akiyama, T. Hirofuchi, R. Takano, S. Honiden: "Fast Wide Area Live Migration with a Low Overhead Through Page Cache Teleportation", The 13th IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing, pp. 78 – 82, 2013. *Cited more than 10 times*

[IEEE CLOUD'12] S. Akiyama, T. Hirofuchi, R. Takano, S. Honiden: "MiyakoDori: A Memory Reusing Mechanism for Dynamic VM Consolidation", The 2012 IEEE 5th International Conference on Cloud Computing, pp. 606 – 613, 2012. *Cited more than 40 times*

[IPSJ Trans ACS-1] 穐山 空道, 広渕 崇宏, 高野 了成, 本位田 真一: "都鳥: メモリ再利用による連続するライブマイグレーションの最適化", 情報処理学会論文誌コンピューティングシステム, Vol. 5, No. 2 (ACS37), pp. 74 - 85, 2012

For non-refereered papers and presentations, please refer to my webpage.

+ Talks in Community Events

[ContainerCon'15] S. Akiyama: "Goplane: Open Source BUM-less Networking for Large Scale Docker Deployment", ContainerCon 2015

[LinuxCon Japan'14] <u>S. Akiyama</u>: "Fast Live Migration for Data-intensive VMs by Exploiting Storage Area Network in Datacenter", LinuxCon Japan 2014

[LinuxCon Japan'12] <u>S. Akiyama</u>: "Acceleration of Virtual Machine Live Migration on QEMU/KVM by Reusing VM Memory" , LinuxCon Japan 2012