

Curriculum Vitae

Shintaro Iwasaki

Research Scientist at Facebook

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<https://shintaro-iwasaki.github.io/>

Shintaro Iwasaki is a Research Scientist at Facebook. Before joining Facebook, I was a Named Fellow at Argonne National Laboratory and part of the Programming Models and Runtime Systems (PMRS) group led by Dr. Pavan Balaji. My research interest includes parallel programming languages, compilers, runtime systems and scheduling techniques for scientific and AI workloads. As the Technical Lead, I was leading a lightweight user-level threading library called Argobots (<https://argobots.org/>) and an OpenMP runtime library over Argobots, BOLT (<https://bolt-omp.org/>). I was also working on MPI + lightweight threads such as MPICH + Argobots (<https://www.mpich.org/>) and Open MPI + Argobots (<https://www.open-mpi.org/>).

Skills

Programming: C, C++, assembly programming (x86/64, POWER8+, ARMv8, and SPARC), low-level programming (inline assembly, atomic operations, compiler builtins, and SIMD), Bash Shell, Python

Parallel Programming: OpenMP, MPI, Pthreads, task parallel systems (Cilk, Cilk++, TBB, Qthreads, Argobots, MassiveThreads, OmpSs, etc)

Education

Ph.D. of Information Science and Technology, the University of Tokyo	2017 Apr. -2020 Mar.
Master of Information Science and Technology, the University of Tokyo	2015 Apr. -2017 Mar.
Bachelor of Engineering in Information Technology, the University of Tokyo	2011 Apr. -2015 Mar.

Awards

Argonne Maria Goeppert Mayer Fellowship (Internationally awarded to 4 doctoral researchers across all research areas)	2021
Finalists of 2020 R&D 100 Award (Argobots: A Lightweight and Highly Flexible Threading Framework)	2020
Argonne 2020 Outstanding Postdoctoral Performance Award in Applied Research (4 postdocs across Argonne National Laboratory were awarded in 2020)	2020
Excellence Award of the Department of Information and Communication Engineering of the Graduate School of Information Science and Technology, the University of Tokyo (3 out of all the Ph D's students in the department)	2020
Best Paper Award in PACT '19 (1 out of 34 papers)	2019
Dean Award of the Department of Information and Communication Engineering of the Graduate School of Information Science and Technology, the University of Tokyo (1 out of all the Master's students in the department)	2017
Best Poster Award in HPDC '16 (3 out of 31 papers)	2016

- Outstanding Student Research Award at ACSI '16** 2016
(1 out of all the student presentations at ACSI '16)
- Computer Science Area Award of Information Processing Society of Japan** 2016
(Awarded annually to 10-20 young computer scientists in Japan)
- Dean Award of the Department of Engineering, the University of Tokyo** 2015
(Summa cum laude equivalent: 1 out of all the students in the department (more than 1,000))

Career

- Research Scientist – Facebook, CA 2021 Aug. -
- Named Fellow - Maria Goeppert Mayer at Argonne National Laboratory, IL 2021 Apr. - 2021 Aug.
Supervisor: Dr. Yanfei Guo
- Postdoctoral Appointee at Argonne National Laboratory, IL 2020 Feb. - 2021 Apr.
Supervisor: Dr. Pavan Balaji
- Predoctoral Appointee at Argonne National Laboratory, IL 2019 May - 2020 Feb.
Supervisor: Dr. Pavan Balaji
- Graduate Research at Argonne National Laboratory, IL 2018 Jan. - 2019 May
Supervisor: Dr. Abdelhalim Amer
- Research Aide at Argonne National Laboratory, IL 2017 Apr. - 2017 Sep.
Supervisor: Dr. Abdelhalim Amer
Duties: Investigating Speculative Execution of Stackless Lightweight Threads

Publications

- S. Shiina, S. Iwasaki, K. Taura, and P. Balaji, *Lightweight Preemptive User-Level Threads*, In PPOPP '21 2021
- N. Evans, J. Ciesko, S. Olivier, H. Pritchard, S. Iwasaki, K. Raffenetti, P. Balaji, *Implementing Flexible Threading Support in Open MPI*, In ExaMPI '20 2020
- S. Iwasaki, A. Amer, K. Taura, and P. Balaji, *Analyzing the Performance Trade-Off in Implementing User-Level Threads*, IEEE Transactions on Parallel and Distributed Systems 31-8 (TPDS) 2020
- S. Iwasaki, A. Amer, K. Taura, S. Seo, and P. Balaji, *BOLT: Optimizing OpenMP Parallel Regions with User-Level Threads*. In PACT '19 2019
(Best Paper Award)
- A. Amer, C. Archer, M. Blocksome, C. Cao, M. Chuvelev, H. Fujita, M. Garzaran, Y. Guo, J. R Hammond, S. Iwasaki, K. J Raffenetti, M. Shiryayev, M. Si, K. Taura, S. Thapaliya, and P. Balaji, *Software Combining to Mitigate Multithreaded MPI Contention*, In ICS '19 2019
- A. Huynh, C. Helm, S. Iwasaki, W. Endo, B. Namsraijav, and K. Taura, *TP-PARSEC: A Task Parallel PARSEC Benchmark Suite*. Journal of Information Processing, 27 (JIP) 2019
- S. Iwasaki, A. Amer, K. Taura, and P. Balaji, *Lessons Learned from Analyzing Dynamic Promotion for User-Level Threading*. In SC '18 2018
- S. Seo, A. Amer, P. Balaji, C. Bordage, G. Bosilca, A. Brooks, P. Carns, A. Castelló, D. Genet, T. Herault, S. Iwasaki, P. Jindal, L. V Kalé, S. Krishnamoorthy, J. Lifflander, H. Lu, E. Meneses, M. 2018

Snir, Y. Sun, K. Taura, and P. Beckman, *Argobots: A Lightweight Low-Level Threading and Tasking Framework*. IEEE Transactions on Parallel and Distributed Systems 29-3 (TPDS)

S. Iwasaki and K. Taura, *A Static Cut-off for Task Parallel Programs*. In PACT '16 2016
(Nominated as one of the three best paper candidates)

S. Iwasaki and K. Taura, *Autotuning of a Cut-off for Task Parallel Programs*. In ATMG '16 2016

Talks

S. Iwasaki, *BOLT: LLVM OpenMP over Lightweight Threads for Massive Fine-Grained Parallelism*, Invited Talk, at LLVM-CTH '21 2021

S. Iwasaki, *Lightweight User-Level Threads for Efficient Resource Utilization: Argobots and BOLT*, Lunch and Learn HPC Talk, Pacific Northwest National Laboratory 2021

S. Iwasaki, *BOLT: A Lightweight and Highly Interoperable OpenMP Runtime System*, Exhibition at SC '20 2020

S. Iwasaki, *Argobots: A Lightweight Threading Framework for Massive Fine-Grained Parallelism*, Invited Talk, at P2S2 '20 2020

S. Iwasaki, *BOLT: A Lightweight OpenMP Library for Massive Fine-Grained Parallelism*, Invited Talk at ECP OpenMP Hackathon 2020 2020

S. Iwasaki, *Lightweight Threaded Runtime Systems for OpenMP*, Exhibition at SC '19 2019

S. Olivier, S. Iwasaki, K. Taura, L. S. Kale, and J. Labarta, *User-Level Threads for Performant and Portable HPC*, Birds of a Feather at SC '19 2019

S. Iwasaki, *Lightweight User-Level Threads for Massive Fine-grained Parallelism: Argobots and BOLT*, Seminar at Oak Ridge National Laboratory 2019

P. Balaji and S. Iwasaki, *Programming with Lightweight Threads: Argobots*, Full-Day Tutorial at PACT '19 2019

S. Iwasaki, *Lightweight Runtime Systems for Massive Fine-Grained Parallelism*, Seminar at Argonne National Laboratory 2019

S. Iwasaki, *Argobots and BOLT: Lightweight Runtime Systems for Massive Fine-Grained Parallelism*, Seminar at Sandia National Laboratory 2019

S. Iwasaki, *BOLT: A Lightning Fast OpenMP Implementation*, Exhibition at SC '18 2018

S. Iwasaki, *Optimistic Execution Techniques for Lightweight Threads*, Seminar at Argonne National Laboratory 2017

S. Iwasaki, K. Taura, *Autotuning for Task Parallel Programs*, Presentation at ACSI '16 2016
(Outstanding Student Research Award)

Poster Presentations

S. Iwasaki, *Exascale OpenMP Runtime Library*. In ECP Annual Meeting '21 2021

S. Iwasaki, A. Amer, and P. Balaji, *BOLT: Lightning-Fast OpenMP*. In ECP Annual Meeting '19 2019

S. Iwasaki, A. Amer, K. Taura, and P. Balaji, *Optimistic Threading Techniques for MPI+ULT*. In EuroMPI '17 2017

S. Iwasaki, An Huynh, C. Helm, B. Namsrajiv, W. Endo, and K. Taura, *TP-PARSEC: A Task-Parallel PARSEC Benchmark Suite*. In RECS '16 2016

S. Iwasaki and K. Taura, *An Automatic Cut-off for Task Parallel Programs*. In HPDC '16 2016
(Best Poster Award)

S. Iwasaki and K. Taura, *SIMD-Aware Static Task Cut-off System*. In 10th AEARU Workshop on Computer Science and Web Technology. 2015

Professional Activities

Program Committee (Programming Models and Systems Software Track): International Conference on High Performance Computing in Asia-Pacific Region (HPC Asia) 2022

Program Committee (Software Track): International Conference on Parallel Processing (ICPP) 2021

Program Committee: International Workshop on Accelerators and Hybrid Exascale Systems (AsHES) 2021

Review Committee: Argonne Training Program on Extreme-Scale Computing (ATPESC) 2021

Student Research Competition Selection Committee: ACM/IEEE International Symposium on Code Generation and Optimization (CGO) 2021

Program Committee: International Workshop on Parallel Programming Models and Systems Software for High-End Computing (P2S2) 2020-2021

Web Chair: International Workshop on Accelerators and Hybrid Exascale Systems (AsHES) 2018

Peer Reviews

External Reviewer: ACM SIGPLAN Annual Symposium Principles and Practice of Parallel Programming (PPoPP) 2022

Reviewer: Software: Practice and Experience (SPE) 2021

Reviewer: Concurrency and Computation: Practice and Experience (CCPE) 2020-2021

Reviewer: Journal of Parallel and Distributed Computing (JPDC) 2020

Reviewer: IEEE Transactions on Parallel and Distributed Systems (TPDS) 2019-2021

External Reviewer: International Conference on Managed Programming Languages & Runtimes (MPLR) 2019

External Reviewer: International Conference on Parallel Architectures and Compilation Techniques (PACT). 2018

Reviewer: Parallel Computing (PARCO) 2018, 2020-2021

External Reviewer: IEEE International Conference on Cluster Computing (CLUSTER) 2018

Membership

ACM: 2034313 (since May 2016)

IEEE: 94508861 (since October 2017)

Others

Student Volunteer at SC '19

2019