Kento Sato

Team Leader, High Performance Big
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Short Bio

Kento Sato is a team leader of High Performance Big Data Research Team in the Center for Computational Science at RIKEN (RIKEN R-CCS). His research area is distributed systems and parallel computing, particularly in High Performance Computing (HPC). Major focuses of his research are artificial intelligence, machine learning and deep learning in HPC, application reproducibility (MPI reproducibility, and Validation), scalable fault tolerance (Scalable checkpoint/restart, Fault tolerant MPI, Resilient system design), and I/O optimization (NVRAM, Burst buffer, and Big data), co-designing and cloud computing. He received his Ph.D. in the Dept. of Mathematical & Computing Sciences at Tokyo Tech in 2014, his M.S. in the Dept. of Mathematical & Computing Sciences at Tokyo Tech in 2010, and his B.S. in the Dept. of Information Science at Tokyo Tech in 2008.

EDUCATION

Mar., 2014 **Ph.D. in Science**, *Department of Mathematical and Computing*, Tokyo Institute of Technology, *Tokyo, Japan*.

Mar., 2010 **Master of Science**, *Department of Mathematical and Computing*, Tokyo Institute of Technology, *Tokyo, Japan*.

Mar., 2008 **Bachelor of Science**, *Department of Information Science*, Tokyo Institute of Technology, *Tokyo, Japan*.
- Graduated top of the department

WORK EXPERIENCE

July., 2019 - present **Visiting Associate Professor**, *Graduate School of System Informatics*, Kobe University Graduate School, *Kobe, Japan*.

Nov., 2018 - present **Team Leader**, *High Performance Big Data Research Team*, RIKEN Center for Computational Science (RIKEN R-CCS), *Kobe, Japan*.

Oct., 2018 **Adjunct Team Leader**, *High Performance Big Data Research Team*, RIKEN Center for Computational Science (RIKEN R-CCS), *Kobe, Japan*.

May, 2018 **Invited Senior Researcher (Category 5 Employee)**, *RWBC-OIL*, National Institute of Advanced Industrial Science and Technology (AIST), *Tokyo, Japan*.

Nov., 2017 - Jan., 2018 **Invited Senior Researcher (Category 5 Employee)**, *RWBC-OIL*, National Institute of Advanced Industrial Science and Technology (AIST), *Tokyo, Japan*.

Sep., 2017 - Oct., 2018 **Computer Scientist**, *Center for Applied Scientific Computing*, Lawrence Livermore National Laboratory, *CA, USA*.

Sep., 2014 - Sep., 2017	**Postdoctoral Researcher**, *Center for Applied Scientific Computing*, Lawrence Livermore National Laboratory, *CA, USA*. ○ PRUNER project (Providing Reproducibility on Ubiquitously Non-deterministic Environments and Runs) ○ Extreme Scale Resilience project
Apr., 2014 - Aug., 2014	**Postdoctoral Researcher**, *Global Scientific Information and Computing Center*, Tokyo Institute of Technology, *Tokyo, Japan*. ○ Extreme Scale Resilience project
Apr., 2012 - Mar., 2014	**JSPS research fellow**, *DC2*, JSPS (Japan Society for the Promotion of Science), *Tokyo, Japan*. ○ I/O optimization in cluster, cluster and grid environments
July, 2013 - Oct., 2013	**Research Intern**, *Center for Applied Scientific Computing*, Lawrence Livermore National Laboratory, *CA, USA*. ○ Developed a Fault tolerant Messaging Interface(FMI); ○ Developed an I/O interface(IBIO) and a resiliency model for burst buffer
Aug., 2012 - Nov., 2012	**Research Intern**, *Center for Applied Scientific Computing*, Lawrence Livermore National Laboratory, *CA, USA*. ○ Developed a Fault tolerant Messaging Interface(FMI)
Aug., 2011 - Nov., 2011	**Research Intern**, *Center for Applied Scientific Computing*, Lawrence Livermore National Laboratory, *CA, USA*. ○ Developed an asynchronous checkpointing system
Oct., 2010 - Mar., 2011	**Research Staff**, *Global Scientific Information and Computing Center*, Tokyo Institute of Technology, *Tokyo, Japan*. ○ I/O optimization in grid environments
Apr., 2010 - Aug., 2010	**Associate**, *Equity Operation*, J.P.Morgan Securities Japan Co., Ltd., *Tokyo, Japan*. ○ Trading system monitoring ○ FIX (Financial Information Exchange) system log analysis ○ Release of algorithm trading programs ○ In-house user service
Oct., 2006 - Jan., 2008	**Business Intern**, *Equity Research*, Deutsche Securities Inc., *Tokyo, Japan*. ○ Developed a financial chart viewer library and a web interface to SQL databases

RESEARCH FUNDING

FY2021- FY2024	PI, "Society5.0 を支える大規模研究施設連携によるビッグデータ収集・解析・利活用基盤の研究開発", *$180,000/4-year* 研究教育拠点 (COE) 形成推進事業研究助成金 (Hyogo/Kobe-COE Fund)
FY2020- FY2021	PI, "並列 I/O 最適化による大規模深層学習の高速化に関する研究 (Optimization of parallel I/O to accelerate large-scale deep neural network training)", *$40,000/2-year* Grant-in-Aid for Early-Career Scientists, KAKEN, https://kaken.nii.ac.jp/en/grant/KAKENHI-PROJECT-20K19811/
FY2020	Co-PI, "格子暗号の安全性を支える数学問題の大規模並列化による解読システムの開発 (Development of Large-scale Decryption System for Reliability of Lattice-based Cryptography)", *$10,000/1-year*

理研-九大科学技術ハブ共同研究プログラム (RIKEN-Kyushu Univ. Science & Technologies Hub Col laborative Research Program)

FY2011-2015 Co-PI, "Fault Tolerant Infrastructure Toward Billion of Parallelization and Exa-scale Supercomputer", *$2,000,000/5-year*

Grant-in-Aid for Scientific Research (S), KAKEN, `https://kaken.nii.ac.jp/en/grant/KAKENHI-PROJECT-23220003/`

FY2012-2013 PI, "広域環境における大規模データ処理の最適化 (Optimization of Big Data Processing in Geographically Distributed Environments)", *$17,000/2-year*

Grant-in-Aid for JSPS Fellows, KAKEN, `https://kaken.nii.ac.jp/en/grant/KAKENHI-PROJEC`

PROFESSIONAL ACTIVITIES

2023 IEEE Cluster 2023 (the IEEE International Conference on Cluster Computing), *Track Co-Chair (in Data, Storage and Visualization)*

2022 HiPC 2022, *Technical Program Committee*

2022 ACM/IEEE SC22, *Track Vice-Chair in Programming Frameworks and System Software*

2022 ACM/IEEE SC22 workshop: PDSW2022 (The 7th International Parallel Data Systems Workshop), *General Chair*

2021 ACM/IEEE SC21 workshop: SuperCheck-SC22 (The Third International Symposium on Checkpointing for Supercomputing), *Program Committee*

2022 ACM/IEEE SC22 workshop: SuperCompCloud (The 6th Workshop on Interoperability of Supercomputing and Cloud Technologies), *Technical Program Committee*

2022 EuroMPI/USA 2022, *Technical Program Committee*

2022 Special Issue on "When Big Data, Data Science and AI meet HPC: Challenges and Opportunities", Cluster Computing (The Journal of Networks, Software Tools and Applications), *Guest Editor*

2022 ISC2022 HPC in Asia, *General Chair*

2022 ACM SYSTOR 2022 (The ACM International Systems and Storage Conference), *Technical Program Committee*

2022 xSIG (The 6th cross-disciplinary Workshop on Computing Systems, Infrastructures, and Programming), *Program Committee Member*

2022 ACM HPDC 2022 (The 31th International Symposium on High-Performance Parallel and Distributed Computing), *Publicity Chair*

2022 ACM HPDC 2022 (The 31th International Symposium on High-Performance Parallel and Distributed Computing), *Poster Committee Member*

2022 ACM HPDC 2022 workshop: FlexScience (formerly ScienceCloud) 2022 (12th Workshop on AI and Scientific Computing at Scale using Flexible Computing Infrastructures), *Organizer*

2022 IEEE IPDPS 2022 workshop: ESSA 2022 (The 3rd International Workshop on Extreme-Scale Storage and Analysis), *Program Co-Chair*

2022   ACM CF22: International Conference on Computing Frontiers 2022, *Steering Committee*

2022   IEEE Cluster 2022, *Proceedings Chair*

2022   IEEE Cluster 2022, *Technical Program Committee*

2022   HPC Asia 2022, *Program Co-Chair*

2021   ACM/IEEE SC21, *Workshop Committee*

2021   ACM/IEEE SC21 workshop: The 6th International Parallel Data Systems Workshop (PDSW2021), *Program Co-Chair*

2021   ACM/IEEE SC21 workshop: SuperCheck (Second International Symposium on Checkpointing for Supercomputing), *Program Committee*

2021   IEEE eScience 2021, *Tutorial co-Chair*

2021   IEEE Cluster 2021, *Technical Program Committee*

2021   EuroMPI2021, *Technical Program Committee*

2021   xSIG (The 5th cross-disciplinary Workshop on Computing Systems, Infrastructures, and Programming), *Program Committee Member*

2021   BDPS2021: International Workshop on BigData Processing Systems, *Program Committee*

2021   ISC2021: HPC in Asia, *Deputy Chair*

2021   ISC2021, *Poster Committee*

2021   ISC2021 workshop: SuperCompCloud (The 4th Workshop on Interoperability of Supercomputing and Cloud Technologies), *Technical Program Committee*

2021   ACM HPDC 2021 (The 30th International Symposium on High-Performance Parallel and Distributed Computing), *Publicity Chair*

2021   ACM HPDC 2021 Workshop: ScienceCloud 2021 (The 11th Workshop on Scientific Cloud Computing), *Organizing co-chair*

2021   ACM ICS'21 (International Conference on Supercomputing), *Program Committee Member*

2021   IEEE IPDPS 2021, *Technical Program Committee*

2020   HPS 2021 (The IEEE International Workshop on High-Performance Storage) in conjunction with IEEE IPDPS 2020 (The 35th IEEE International Parallel and Distributed Processing Symposium), *Program Committee*

2021   ICPP 2021 (The 50th the International Conference on Parallel Processing), *Program Committee Member*

2021   ACM CF21 (ACM International Conference on Computing Frontiers 2021), *Industrial Sponsorship Co-Chair*

2021   ACM CF21 (ACM International Conference on Computing Frontiers 2021), *Steering Committee*

2021   IEEE Transactions on Parallel and Distributed Systems (TPDS)'s special section on Innovative R&D toward the Exascale Era, *Committee Member*

2021   Journal of Signal Processing Systems (1613), *Journal Editor*

2021   IEEE Transactions on Parallel and Distributed System (TPDS)'s special section on "Parallel and Distributed Computing Techniques for AI, ML and DL", *Program Committee Member*

2021   The 3rd R-CCS International Symposium, *General Co-Chair*

2021   SDRJ (The System Device Roadmap Committee of Japan), *Sub-leader in applicatin benchmarking WG*

2020   ACM/IEEE SC20 workshop: The 5th International Parallel Data Systems Workshop (PDSW2020), *Program Vice Chair*

2020   ACM/IEEE SC20 workshop: SuperCompCloud (The 3rd Workshop on Interoperability of Supercomputing and Cloud Technologies), *Technical Program Committee*

2020   EuroMPI/USA'20, *Technical Program Committee*

2020   IEEE Cluster 2020, *Technical Program Committee*

2020   IEEE Cluster 2020, *Poster Chair*

2020   ACM HPDC 2020 (The 29th International Symposium on High-Performance Parallel and Distributed Computing), *Publicity Co-Chair*

2020   ACM HPDC 2020 Workshop: ScienceCloud2020 (The 10th Workshop on Scientific Cloud Computing), *Organizing Chair*, [CANCELED]

2020   HPC in Asia/ISC2020, *Deputy Chair*

2020   ISC2020 Workshop: SuperCompCloud (The 2nd Workshop on Interoperability of Supercomputing and Cloud Technologies), *Technical Program Committee*, [CANCELED]

2020   HPS 2020 (The IEEE International Workshop on High-Performance Storage) in conjunction with IEEE IPDPS 2020 (The 34th IEEE International Parallel and Distributed Processing Symposium), *Organizing Committee*

2020   HPS 2020 (The IEEE International Workshop on High-Performance Storage) in conjunction with IEEE IPDPS 2020 (The 34th IEEE International Parallel and Distributed Processing Symposium), *Technical Program Committee*

2020   ACM International Conference on Computing Frontiers (CF), *Publicity Co-Chair*

2020   The 2nd R-CCS International Symposium, *Technical Program Committee*

2020   HPC Asia 2020 (International Conference on High Performance Computing in Asia-Pacific Region), *Track Chair (in Programming Models and Systems Software)*

2019   ACM/IEEE SC19, *BoF Committee*

2019   ICPP 2019 (International Conference on Parallel Processing 2019), *Technical Program Committee*

2019   IEEE Cluster 2019, *Poster Committee*

2019   ACM HPDC 2019 (The 28th International Symposium on High-Performance Parallel and Distributed Computing), *Travel Grant Committee*

2019   PDML19 (The 1st Workshop on Parallel and Distributed Machine Learning 2019) in conjunction with ICPP 2019 (International Conference on Parallel Processing 2019), *Organizer*

2019   ICS 2019 (International Conference on Supercomputing), *Technical Program Committee*

2019   ACM International Conference on Computing Frontiers (CF), *Program Co-Chairs*

2019   R-WoNC'19 (Riken International Workshop on Neuromorphic Computing), *Publicity Co-Chairs*

2019   HPC Asia 2019 (International Conference on High Performance Computing in Asia-Pacific Region), *Technical Program Committee*

2018   ACM/IEEE SC18, *Posters Committee*

2018   ACM/IEEE SC18 workshop: The joint International Workshop on Parallel Data Storage & Data Intensive Scalable Computing Systems (PDSW-DISCS), *Program Committee*

2018   IEEE Cluster 2018, *Poster Committee*

2018   IEEE Transactions on Parallel and Distributed Systems (TPDS-2018-02-0076), *Reviewer*

2018   HPC Asia (International Conference on High Performance Computing in Asia-Pacific Region), *Technical Program Committee*

2018   HPC Asia (International Conference on High Performance Computing in Asia-Pacific Region), *Technical Poster Committee*

2017   ACM/IEEE SC17, *Posters Committee*

2017   ACM/IEEE SC17, *BoF Committee*

2017   ACM/IEEE SC17 workshop: The joint International Workshop on Parallel Data Storage & Data Intensive Scalable Computing Systems (PDSW-DISCS), *Program Committee*

2017   ACM/IEEE SC17 workshop: The first International Workshop on Software Correctness for HPC Applications (Correctnes2017), *Program Committee*

2017   IEEE Cluster, *Proceedings Chair*

2017   IEEE Cluster, *Technical Program Committee*

2017   IEEE Cluster workshop: The 3rd International Workshop on Fault Tolerant Systems (FTS2017), *Technical Program Committee*

2017   ICPP (International Conference on Parallel Processing), *Program Committee Members*

2016   IEEE Cluster, *Technical Program Committee*

2016   IEEE/ACM CCGrid, *Technical Program Committee*

2016   IEEE Cluster workshop: The 2nd International Workshop on Fault Tolerant Systems (FTS2016), *Technical Program Committee*

2015   IEEE Cluster, *Technical Program Committee*

2015   IEEE Cluster workshop: The 1st International Workshop on Fault Tolerant Systems (FTS2015), *Technical Program Committee*

2014   IEEE Transactions on Parallel and Distributed Systems (TPDS-2014-01-0069), *Reviewer*

2014 Concurrency and Computation: Practice and Experience (CPE-14-0353), *Reviewer*

2013 IEEE Transactions on Parallel and Distributed Systems (Journal), *Reviewer*

2013 Parallel Computing (Journal), Reviewer

AWARDS & SCHOLARSHIP

Dec., 2019 R&D 100 Award Winner on "SCR Framework"

Jun., 2018 Best poster award in ISC18 on "HuronFS: Hierarchical, User-level and On-demand Burst Buffer File System"

Nov., 2017 R&D 100 Award Finalist on "PRUNERS Toolset"

Nov., 2017 Best poster finalist in SC17 on "A Simulation-Based Analysis on the Configuration of the Burst Buffer"

Nov., 2017 Best poster finalist in SC17 on "Towards Capturing Nondeterminism Motifs in HPC Applications"

Mar., 2017 Best poster award at the Computation Directorate March 2017 Postdoctoral Poster Symposium in LLNL

Feb., 2015 Seiichi Tejima Doctoral Dissertation Award (平成26年度手島精一記念研究賞授与式 情報学関係部門) on "Design and Implementation for Optimal Checkpoint/Restart"

Mar., 2014 IEEE/ACM CCGrid2014 Best Paper Award

Apr., 2012 Japanese Society for the Promotion of Science (JSPS) scholarship for two years, (Research fund: $10k/year)

Mar., 2008 Graduated top of the Department of Information Science, Tokyo Institute of Technology, Awarded

Teaching

FY2019-2022 神戸大学大学院 「大規模シミュレーション応用論」（集中講義）

FY2019-2022 神戸大学大学院 「大規模シミュレーション総論II」

FY2007 東京工業大学 「計算機システム」(TA)

GRADUATE ADVISOR

Satoshi Matsuoka, Tokyo Institute of Technology