Seung-Jong (Jay) Park

Kummer Endowed Chair of Computer Science Department

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PROFESSIONAL EXPERIENCE SUMMARY

- **Kummer Endowed Chair of CS Department, Missouri S&T:**
  Lead the Computer Science Department, overseeing more than 1,000 undergraduate and graduate students and 20 professorial faculty. Developed new academic programs, including the M.S. in Applied Artificial Intelligence (AI+X) and the B.S./M.S. in Data Science, aligning departmental growth with institutional strategic priorities.
- **Leader, Generative AI Initiatives:**
  Established and directed the MinerAI initiatives (minerai.mst.edu), a university-wide AI innovation initiatives and developed major proposals including a $2M MoExcels AI workforce development initiative and a $10M AI GPU infrastructure proposal to the Kummer Institute, advancing S&T's research and educational capacity in generative AI and high-performance computing.
- **Program Director, National Science Foundation (NSF)** - Office of Advanced Cyberinfrastructure (OAC):
  Managed NSF programs with a combined portfolio exceeding $156 million, supporting national research in data, networking, and computational infrastructure. Co-chaired the Middleware and Grid Interagency Coordination (MAGIC) committee under the Networking and Information Technology Research and Development (NITRD) program, fostering federal interagency collaboration.
- **Professor and Principal Investigator:**
  Conducted multidisciplinary research integrating Big Data, Deep Learning, High-Performance Computing (HPC), Cloud and Serverless Computing, and High-Speed Networking. Secured over $10 million in federal, state, and industry funding while leading large-scale software framework development for science and engineering applications.
- **Associate Director, LSU Center for Computation & Technology (CCT):**
  Led major cyberinfrastructure development initiatives for CCT with an annual budget of $9 million. Supervised over 10 Ph.D.-level research scientists and directed high-impact projects in computational science and engineering as part of LSU's flagship HPC research center.
- **Advisor and Educator:**
  Taught undergraduate and graduate courses in computer systems, networks, and algorithms. Supervised more than 40 graduate students, including 20 Ph.D. graduates who now hold positions in academia (e.g., University of Houston, University of Alaska Fairbanks, LSU-Shreveport) and industry (e.g., Google, Microsoft, IBM, NetApp).

EDUCATION

Ph.D.	Electrical & Computer Engineering	Georgia Institute of Technology, GA	2004
M.S.	Computer Science	KAIST, Korea	1995
B.S.	Computer Science	Korea University, Korea	1993

HONORS AND AWARDS

- Kummer Endowed Department Chair 2023-present
- Dr. Fred H. Fenn Memorial Professorship 2014-2023
- IBM FACULTY RESEARCH AWARD 2017-2019

PROFESSIONAL EXPERIENCE

Kummer Endowed Chair of Computer Science, 2023-Current
Computer Science Department, Missouri University of Science & Technology

- Has led the Computer Science Department which has BS, MS, Doctorial Programs with more than 1,000 under-/graduate students and 20 professorial faculty after hiring 8 new Tenured/Tenure Track faculty members focusing on AI and Cybersecurity.
- Has developed new academic programs including MS of Applied Artificial Intelligence (https://cs.mst.edu/graduate-degrees/masterofscienceinappliedai/) and Data Science BS & MS programs to accommodate the new demands of the state-of-the-art technologies.
- Has reorganized the curriculums of CS BS and CS MS programs incorporating the state-of-the-art technologies including, artificial intelligence, deep learning, large language models, cloud computing, cybersecurity, etc.
- Has developed scalable serverless computing platforms for distributed reinforcement learning applications over GPU infrastructure and published papers at SC24 (The International Conference for High Performance Computing, Networking, Storage, and Analysis), VLDB, ACM ASPLOS (International Conference on Architectural Support for Programming Languages and Operating Systems), and IEEE Transactions on Parallel and Distributed Systems.
- Has created new collaborative pilot research projects with researchers at School of Medicine, Saint Louis University to implement generative AI models (e.g., vision-language models for the analysis of multimodal biomedical data) and faculty at S&T Mechanical Engineering to develop vision-language-action and diffusion models for controlling humanoids.

Program Director (PD, Rotator), 2021-2023
Office of Advanced Cyberinfrastructure (OAC),
Directorate of Computer and Information Science and Engineering (CISE), National Science Foundation.

- Has developed and managed NSF program portfolio that enables research software and data cyberinfrastructure (CI) development. The portfolio is diverse in terms of types of CIs (data/software/HPC clusters/cloud), and the overall award amount is over $156M.
- Has led the OAC Core program that supports translational research and education in all aspects of advanced CI leading to deployable, scalable, and sustainable systems capable of transforming science and engineering.
- Has led the CISE Principles and Practice of Scalable Systems (PPoSS) of which total anticipated funding amount is $83M and collaborated with PDs at CISE divisions to support interdisciplinary research spanning the entire hardware-software stack and studies the scalability and accuracy of modern applications, systems and toolchains built on heterogeneous architectures.

- Has collaborated with OAC and other NSF directorates' PDs to manage the Cyberinfrastructure for Sustained Scientific Innovation (CSSI) program, the largest OAC led NSF multidisciplinary program of which anticipated annual funding amount is more than $34M.
- Has coordinated the Computational and Data-Enabled Science and Engineering (CDS&E) that supports research with new computational and data science approaches to advance knowledge and accelerate discovery in science and engineering with other NSF directorate's PDs.
- Has collaborated with OAC PDs to manage OAC learning and workforce development (LWD) programs, including NSF Faculty Early Career Development Program (CAREER) and Training-based Workforce Development for Advanced Cyberinfrastructure (CyberTraining).
- Has performed the role of liaison between the office of Established Program to Stimulate Competitive Research (EPSCoR) and CISE divisions for co-funding.
- Has co-chaired at the Inter-agency working group, the Middleware and Grid Interagency Coordination (MAGIC) team within the Large-Scale Networking (LSN) on Networking and Information Technology Research and Development (NITRD), a federal cross-agency initiative.

Full Professor with tenure, 2016-2023
Computer Science and Engineering Division, Louisiana State University.

- Has developed cost-efficient resource managers for serverless computing platforms that dynamically harvest idle resources based on machine learning technologies, including reinforcement and active learnings (published a paper at ACM Web Conf, previously known as WWW).
- Has developed scalable software and algorithms for data-and compute-intensive scientific applications and proposed new cluster architectures that these software tools need for extreme-scale performance (published papers at IEEE ICDCS, IEEE Cloud, IEEE Bigdata Conferences).
- Has developed large-scale data analysis software frameworks using deep-learning technologies for biomedical data, including Mammogram, ECG, PPG, Xray, etc., over HPC and Cloud computing environment (published papers at MICCAI, IEEE BIBM, ACM BCB).
- Has developed large-scale software frameworks analyzing (whole genome assembly, genome indexing, error correction, etc.) scientific datasets including meta genome data (published papers at BMC Genomics, IEEE IPDPS, IEEE Bigdata, IEEE BIBM).

Associate Director, 2016-2018
Center for Computation and Technology, Louisiana State University.

- Developed and managed a supercomputer, SuperMIC (funded by NSF MRI grant), consisting of heterogeneous HPC devices, including Intel Xeon Phi and NVIDIA Kepler GPU accelerators to enable multidisciplinary research projects, including coastal environmental modeling, simulating the motions of tumors/organs in cancer patients and managed its resource commitments to state universities and NSF Extreme Science and Engineering Discovery Environment (XSEDE) communities.
- Coordinated large-scale state-wide and federal research initiatives (e.g., Louisiana Optical Network Initiative (LONI) and Louisiana Alliance for Simulation-Guided Materials Applications (LA-SiGMA) and supervised research scientists in multidisciplinary domain areas).

Graduate Advisor, 2012-2015
Computer Science Department, Louisiana State University.

- Advised more than 200 graduate students, including master and doctoral students at the Computer Science Department.
- Redesigned the Master program by restructuring course requirements for master students so that master students should learn more number Computer Science courses.
- Led annual evaluation meetings for doctoral students with graduate faculties.

Associate Professor with tenure, 2010-2016
Computer Science Department, Louisiana State University.

- Developed a cyberinfrastructure using technologies, including 40Gbps Software Defined Network and Hadoop-based Big data software framework for the Big data analysis in the areas of Computational Biology, and Computational chemistry supported by the NSF Campus Cyberinfrastructure Network Integration (CC-NIE) program (published papers at IEEE Bigdata, XSEDE 16)
- Developed fair and low latency adaptive queue management (e.g., Approximated-Fair and Controlled-Delay (AFCD) queuing, FaLL: a Fair and Low Latency Queuing, etc.) based network protocols for high-speed optical networks and data center networks (published papers at JNCA)
- Developed new TCP variants, including Desynchronized Multi-Channel TCP (DMCTCP) that creates a flow with parallel channels and avoids TCP loss synchronization problems for high-speed networks with tiny buffers (published at ICNC, ICCCN, J. of Computer Comm.).

Tenure-track Assistant Professor, 2004-2010
Computer Science Department, Louisiana State University.

- Developed big data software framework for large scale scientific applications, such as large genome analysis, X-ray image analysis, using distributed computing frameworks, e.g., Hadoop and Giraph.
- Developed a Cyberinfrastructure of Reconfigurable Optical Networks (CRON) consisting of hardware and software network emulators and 10Gbps switches to build an integrated and automated access to a wide range of high-speed networking configurations.
- Developed a hybrid simulator combining fluid and packet-based models for large scale networks, such as planetary-scale sensor networks and 10Gbps high speed optical networks.
- Developed an improved virtual screening method which reduces the size of candidates for cancer drugs from more than millions of ligands databases by combining data classification using hidden Markov model and data mining methods (published paper at Journal of Analytical Biochemistry).
- Developed energy-efficient sensor network transport protocols (published papers at IEEE Trans. Mobile Computing, IEEE ICC, ACM Mobihoc).

RESEARCH PROJECTS & GRANTS

Federal Funding

1. NSF "CSR: Medium: Enhancing Energy Awareness for Efficient Federated Learning over Mobile AI Systems", Award Number:2403248, Principal Investigator: Seung-Jong Park, NSF: CNS, 2024-2028; Award Amount:$300,000.00.

2. NSF, “OAC: Core: Harvesting Idle Resources Safely and Timely for Large-scale AI Applications in High-Performance Computing Systems”, Award Number:2403399, Principal Investigator: Seung-Jong Park, NSF OAC, 2024-2027; Award Amount: $300,000.00.
3. NSF, “Intergovernmental Personnel ACT (IPA) Agreement,” PI, NSF, $767,445.00, 2021-2023.
4. NASA, “GeoHealth: A geospatial surveillance and response system resource for vector borne disease,” Co-PI, NASA, $463,468.00, 2018 – 2022.
5. NSF, “IBSS-L: Understanding Social and Geographical Disparities in Disaster Resilience Through the Use of Social Media,” Co-PI, NSF, $834,585.00, 2016-2020.
6. NSF, “RAPID: The Changing Roles of Social Media in Disaster Resilience: The Case of Hurricane Harvey,” Co-PI, NSF, $199,989, 2018-2020.
7. NIH, “Louisiana Biomedical Research Network and Computational Research and Education (LBRN),” SI, NIH, $18,500,000.00, 2015-2020.
8. NSF, “Acquisition of SuperMIC - A Heterogeneous Computing Environment to Enable Transformation of Computational Research and Education in the State of Louisiana,” PI, NSF, $3,924,181.00, LSU Match: $ 1,681,792.00, 2013-2019.
9. NSF, “SCC-Planning: Promoting Smart Technologies in Public Safety and Transportation to Improve Social and Economic Outcomes in a US EDA-Designated Critical Manufacturing Region,” PI, NSF, $99,932.00, 2017-2019.
10. NSF, “Bridging, Transferring, and Analyzing Big Data over 10Gbps Campus-wide Software Defined Networks,” PI, NSF, $947,860.00, 2013-2018.
11. AFRL, “Cyber Security Research: 1-Performance Optimization of Distributed Hadoop-based Cloud Computing Data Centers Integrated with Android Smartphone Clouds 2- Defensive Techniques for Distributed Sensing Systems,” Co-PI, Air Force Research Laboratory, $200,008.00, 2012-2013.
12. NSF, “Integrating a CRON (Cyberinfrastructure of Reconfigurable Optical Network) Testbed into ProtoGENI,” PI, NSF (GENI), $266,688.00, 2009-2013.
13. NSF, “CRON: Development of a Cyberinfrastructure Reconfigurable Optical Network for Large-Scale Scientific Discovery,” PI, NSF, $495,181.00, LSU match: $201,796.00, 2008-2013.
14. ONR, “Secure and Survivable Cyber-Centric Sensor Networks: Algorithms and Architecture Research,” PI, Office of Naval Research, $781,731.00, 2008-2012.
15. NIH, “PFKFB3-based development of a new cancer drug targeting the Warburg effect,” CoI, NIH, $1,099,350.00, 2008-2012.
16. NSF, “TeraGrid: Mid-size Allocation,” PI, 250K hours, NSF TeraGrid, 2009-2010.

State Funding

17. “Developing Deep Learning Frameworks for Bioinformatics using IBM Power8 clusters and CAPI technology,” Co-PI, LA Board of Regents (BOR): $ 327,079.00, LSU match: 397,279.00, 2016-2019.
18. “Developing a Fluid Based Simulator and Transport Protocols for Large-Scale Wireless Sensor and Actor Networks,” PI, Louisiana Board of Regents, $82,280.00, 2006-2008.
19. “MoExcels: AI Workforce Accelerator,” Co-PI, $2,000,000.00, 2027.

Industrial Funding

20. “Bootstrapping a Community Infrastructure for Transformative Research with IBM POWER Systems,” PI, IBM, $20,000.00., 2017-2019.
21. “Developing a Fluid Based Simulator and Transport Protocols for Large-Scale Wireless Sensor and Actor Networks,” PI, Louisiana Board of Regents, $82,280.00, 2006-2008.

LSU Internal Funding

22. "Developing an adaptive and parallel transport protocol for large-scale scientific applications over high speed networks," PI, LSU Office of Research and Economic Development, $10,000.00, 2005-2005
23. "Developing an Adaptive Simulation Method to Predict Behaviors of Transport Protocols over High Speed Optical Networks," PI, LSU CCT General Development Program, $60,000.00, 2005-2006.
24. "Developing an Adaptive Simulation Method to Predict Behaviors of Transport Protocols over High Speed Optical Networks," PI, LSU Office of Research and Economic Development, $5,000.00, 2005-2005.

PUBLICATIONS (Peer Reviewed Journals and Conferences)

Developing Large-scale distributed software frameworks related to AI and HPC

1. Hanfei Yu, Jacob Carter, Hao Wang, Devesh Tiwari, Jian Li, Seung-Jong Park, "Nitro: Boosting Distributed Reinforcement Learning with Serverless Computing," in the 51st International Conference on Very Large Data Bases (VLDB), London, United Kingdom – September 1-5, 2025.
2. Hanfei Yu, Hao Wang, Devesh Tiwari, Jian Li, Seung-Jong, Park, "Stellaris: Staleness-aware Distributed Reinforcement Learning with Serverless Computing,", ACM SC '24: Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis, Atlanta, GA, 2024.
3. Hanfei Yu, Rohan Basu Roy, Christian Fontenot, Devesh Tiwari, Jian Li, Hong Zhang, Hao Wang, and Seung-Jong Park, "RainbowCake: Mitigating Cold-starts in Serverless with Layer-wise Container Caching and Sharing," in Proceedings of the ACM Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), 2024.
4. H. Yu, H. Wang, J. Li, X. Yuan and Seung-Jong Park, "Freyr + +: Harvesting Idle Resources in Serverless Computing via Deep Reinforcement Learning," in IEEE Transactions on Parallel and Distributed Systems, vol. 35, no. 11, pp. 2254-2269, Nov. 2024, doi: 10.1109/TPDS.2024.3462294.
5. Hanfei Yu, Christian Fontenot, Hao Wang, Jian Li, Xu Yuan, and Seung-Jong Park, "Libra: Harvesting Idle Resources Safely and Timely in Serverless Clusters," in Proceedings of the International Symposium on High-Performance Parallel and Distributed Computing (HPDC), 2023.
6. Hanfei Yu, Hao Wang, Jian Li, Xu Yuan, Seung-Jong Park, "Accelerating Serverless Computing by Harvesting Idle Resources", in the proceeding of the ACM WEB (formerly known as International World Wide Web Conference) 2022, Lyon, France, April 2022.
7. Sayan Goswami, Kisung Lee, and Seung-Jong Park, "Distributed de novo assembler for large-scale long-read datasets," in the proceeding of the IEEE International Conference on Big Data, Dec., 2020.
8. Nakhoon Baek, Seung-Jong Park, "An OpenMP-based Parallel Execution of Neural Networks Specified in NNEF," in the proceeding of the 20th International Conference on Algorithms and Architectures for Parallel Processing (ICA3PP), 723-726, Oct 2-4, 2020.
9. H. Fleifel, M. Izadi, Seung-Jong Park, I. Gupta, G.S. Lee, and S.I. Kam, "Shallow Subsurface Environmental Remediation by Using Tracer-Surfactant-Foam Processes: History-Matching and Performance Prediction," in the Journal of Transport in Porous Media, p. 565-592, Vol. 134, Issue 3, Sept., 2020.

10. Das, A.K., Goswami, S., Lee, K., Park, S.-J., “A hybrid and scalable error correction algorithm for indel and substitution errors of long reads,” BMC Genomics 20, 948, 2019, https://doi.org/10.1186/s12864-019-6286-9.
11. Lei Zou, Nina S. N. Lam, Shayan Shams, Heng Cai, Michelle A. Meyer, Seungwon Yang, Kisung Lee, Seung-Jong Park & Margaret A. Reams (2019) Social and geographical disparities in Twitter use during Hurricane Harvey, International Journal of Digital Earth, 12:11, 1300-1318, DOI: 10.1080/17538947.2018.1545878.
12. Arghya Kusum Das, Kisung Lee and Seung-Jong Park, “ParLECH: Parallel Long-read Error Correction with Hadoop,” in the proceeding of the IEEE International Conference on Bioinformatics and Biomedicine (BIBM), Madrid, Spain, Dec 2018.
13. Shayan Shams, Richard Platania, Jian Zhang, Joohyun Kim, Seung-Jong Park, “Deep Generative Breast Cancer Screening and Diagnosis,” in the proceeding of the 21st International Conference on Medical Image Computing & Computer Assisted Intervention (MICCAI), Granada, Spain, 2018.
14. Shayan Shams, Richard Platania, Joohyun Kim, Jian Zhang, Kisung Lee, Seungwon Yang, Seung-Jong Park, “A Distributed Semi-Supervised Platform for DNase-Seq Data Analytics using Deep Generative Convolutional Networks,” in the proceeding of the 9th ACM Conference on Bioinformatics, Computational Biology, and Health Informatics (ACM BCB), Washington DC, Aug, 2018.
15. Sayan Goswami, Kisung Lee, Shayan Shams and Seung-Jong Park, “GPU-Accelerated Large-Scale Genome Assembly,” in the proceeding of IEEE International Parallel & Distributed Processing Symposium (IPDPS), 2018, Vancouver, Canada.
16. Shayan Shams, Sayan Goswami, Kisung Lee, Seungwon Yang, Seung-Jong Park, “Towards Distributed Cyberinfrastructure for Smart Cities using Big Data and Deep Learning Technologies,” in the proceeding of the 38th IEEE International Conference on Distributed Computing Systems, ICDCS2018, July 2 - 5, 2018, Vienna, Austria.
17. Richard Platania, Shayan Shams, Seungwon Yang, Jian Zhang, Kisung Lee, Seung-Jong Park, “Automated Breast Cancer Diagnosis Using Deep Learning and Region of Interest Detection (BC-DROID),” in the proceeding of the 7th ACM Conference on Bioinformatics, Computational Biology, and Health Informatics (ACM BCB) 2017, 536-543.
18. Arghya Kusum Das, Praveen Kumar Koppa, Sayan Goswami, Richard Platania, and Seung-Jong Park, “Large-scale parallel genome assembler over cloud computing environment,” Journal of Bioinformatics and Computational Biology, June 2017, Vol. 15, No. 03, https://doi.org/10.1142/S0219720017400030.
19. Andrew Case, Arghya Das, Seung-jong Park, J. Ramanujam, Golden G Richard III, Golden G, “Gaslight: A comprehensive fuzzing architecture for memory forensics frameworks,” In the proceeding of e Seventeenth Annual DFRWS, Digital Investigation, 22, S86-S93, 10.1016/j.diin.2017.06.011, 2017.
20. Arghya Kusum Das, Jaeki Hong, Sayan Goswami, Richard Platania, Kisung Lee, Wooseok Chang, Seung-Jong Park, Ling Liu, “Augmenting Amdahl's Second Law: A Theoretical Model to Build Cost-Effective Balanced HPC Infrastructure for Data-Driven Science,” in the proceeding of the IEEE International Conference on Cloud Computing (CLOUD) 2017, Honolulu, USA.
21. Shayan Shams, Richard Platania, Kisung Lee and Seung-Jong Park, “Evaluation of Deep Learning Frameworks over Different HPC Architectures,” in the proceeding of the 37th IEEE International Conference on Distributed Computing Systems (ICDCS 2017), Atlanta, USA, 2017.

22. Chui-Hui Chiu, Dipak Kumar Singh, Qingyang Wang, Seung-Jong Park, “Coflourish: An SDN-Assisted Coflow Scheduling Framework for Clouds,” in the proceeding of the IEEE International Conference on Cloud Computing (CLOUD) 2017, Honolulu, USA.
23. Chui-Hui Chiu, Dipak Kumar Singh, Qingyang Wang, Kisung Lee, Seung-Jong Park, “Minimal Coflow Routing and Scheduling in OpenFlow-based Cloud Storage Area Networks,” in the proceeding of the IEEE International Conference on Cloud Computing (CLOUD) 2017, Honolulu, USA.
24. Sayan Goswami, Arghya Kusum Das, Richard Platania, Kisung Lee, and Seung-Jong Park, “Lazer: Distributed Memory-Efficient Assembly of Large-Scale Genomes,” in the proceeding of the IEEE International Conference on Big Data (IEEE BigData), 2016.
25. Richard Platania, Shayan Shams, Chui-Hui Chiu, Nayong Kim, Joohyun Kim, *Seung-Jong Park*, “Hadoop-based replica exchange over heterogeneous distributed cyberinfrastructures,” in the journal of Concurrency and computation: Practice and Experience, Wiley 2016, doi: 10.1002/cpe.3878.
26. Praveen Kumar Kondikoppa, Arghya Kusum Das, Sayan Goswami, Richard Platania, *Seung-Jong Park*, “Giraph-based Genome Assembler for Gigabase Scale Genomes,” in the proceeding of the 8th International Conference on Bioinformatics and Computational Biology (BICoB), pp.55-62, Las Vegas, USA, 2016.
27. Chui-hui Chiu, Nathan Lewis, Dipak Kumar Singh, Arghya Kusum Das, Mohammad M Jalazai, Richard Platania, Sayan Goswami, Kisung Lee, *Seung-Jong Park*, “BIC-LSU: Big Data Research Integration with Cyberinfrastructure for LSU”, in proceedings of the 2016 XSEDE Conference (XSEDE16), Miami, FL, USA, 2016
28. Arghya Kusum Das, *Seung-Jong Park*, Jaeki Hong, Wooseok Chang, “Evaluating different distributed cyber-infrastructure for data and compute intensive scientific application,” in the proceeding of IEEE Bigdata Conference (acceptance rate: 17%), pp134-143, 2015.
29. Nayong Kim, Richard Platania, Tom Keyes, Wei Huang, Chris Knight, *Seung-Jong Park*, Joohyun Kim, “Enabling Large-scale Biomolecular Conformation Search with Replica Exchange Statistical Temperature Molecular Dynamics (RESTMD) over HPC and Cloud Computing Resources,” in the proceeding of the 8th International Workshop on Bio and Intelligent Computing (BiCOM-2015), pp.61-66, Korea, 2015.
30. Arghya Das, Praveenkumar Kondikoppa, *Seung-Jong Park*, “Experimenting Big Data Applications for Genome Sequence Assembly over NSF-Cloud,” in the Proceeding of the NSFCloud Workshop on Experimental Support for Cloud Computing, VA 2014.
31. Praveenkumar Kondikoppa, Umesh Chandra, *Seung-Jong Park*, Manish Patil and Rahul Shah, “MapReduce based Parallel Suffix Tree Construction for Human Genome,” in the proceeding of the 20th IEEE International Conference on Parallel and Distributed Systems (ICPADS), pp.664-670, Taiwan, Dec 2014.
32. Praveenkumar Kondikoppa*, Richard Platania*, *Seung-Jong Park*, Shuju Bai*, Tom Keyes and Jaegil Kim, Nayong Kim, and Joohyun Kim, “MapReduce-based RESTMD: Enabling Large-scale Sampling Tasks with Distributed HPC Systems”, in the proceeding of the International Workshop for Science Gateways, pp.30-35, Jun. 2014.
33. Shuju Bai, E. Khosravi, and *Seung-Jong Park*, “An MPI-enabled MapReduce framework for molecular dynamics simulation applications,” in the proceeding of the 2013 IEEE International Conference on Bioinformatics and Biomedicine (BIBM), poster paper, pp.1-3, Dec. 2013.

34. Jin Niu, Shuju Bai, E. Khosravi, and *Seung-Jong Park*, "A Hadoop approach to advanced sampling algorithms in molecular dynamics simulation on cloud computing," in the proceeding of the 2013 IEEE International Conference on Bioinformatics and Biomedicine (BIBM) (acceptance rate: 17.9%), pp.452-455, Dec. 2013.
35. Manish Patil, Xuanting Cai, Sharma V. Thankachan, Rahul Shah, *Seung-Jong Park*, David Foltz, "Approximate string matching by position restricted alignment," in the proceeding of the International Conference on Extending Database Technology (EDBT)/ International Conference on Database Theory (ICDT Workshops) (acceptance rate: 20%), pp.384-391, 2013.
36. Praveenkumar Kondikoppa, Seung-Jong Park, Chui-Hui Chiu*, Cheng Cui* and Lin Xue*, "Network-Aware Scheduling of MapReduce Framework on Distributed Clusters over High Speed Networks," in the proceeding of the Workshop on Cloud Services, Federation, and the 8th Open Cirrus Summit, pp. 39-44, San Jose, USA. 2012.
37. Robert B. Crochet, Michael C. Cavalier, Minsuh Seo, Jeong Do Kim, Young-Sun Yim, *Seung-Jong Park*, Yong-Hwan Lee, "Investigating combinatorial approaches in virtual screening on human inducible 6-phosphofructo-2-kinase/fructose-2, 6-bisphosphatase (PFKFB3): A case study for small molecule kinases," in the Journal of Analytical Biochemistry, Elsevier, Volume 418, Issue 1, pp.143-148, 2011.

Developing High Speed Networks and Protocols

38. Lin Xue, Suman kumar, Chui-Hui Chiu, *Seung-Jong Park*, "Towards Fair and Low Latency Next Generation High Speed Networks: AFCD Queuing," in the journal of Network and Computer Applications, Elsevier, Vol 70, Issue C, pp. 183-193, 2016, doi: 10.1016/j.jnca.2016.03.021.
39. Cheng Cui, Lin Xue, Chui-Hui Chiu, Praveenkumar Kondikoppa, *Seung-Jong Park*, "Exploring Parallelism and Desynchronization of TCP over High-Speed Networks with Tiny Buffers," in the journal of Computer Communication, Elsevier, Volume 69 Issue C, pp. 60-68, 2015
40. Lin Xue, Chui-Hui Chiu, Suman Kumar, Praveenkumar Kondikoppa, Seung-Jong Park, "FaLL: a Fair and Low Latency Queuing Scheme for Data Center Networks," in the Proceeding of the International Conference on Computing, Networking and Communications, (ICNC), pp.771-777, 2015.
41. Cheng Cui, Lin Xue, Chui-Hui Chiu, Praveenkumar Kondikoppa*, *Seung-Jong Park*, "DMCTCP: Desynchronized Multi-Channel TCP for High Speed Access Networks with Tiny Buffers," in the proceeding of the 23rd IEEE International Conference on Computer Communications and Networks, ICCCN, pp.1-8, 2014.
42. Lin Xue, Suman Kumar, Cheng Cui, *Seung-Jong Park*, "A Study of Fairness among Heterogeneous TCP Variants over 10Gbps High-speed Optical Networks," in the Journal of Optical Switching and Networking, Elsevier, Volume 13, pp.124-134, 2014.
43. Lin Xue, Suman Kumar, Cheng Cui, Praveenkumar Kondikoppa, Chui-Hui Chiu*, *Seung-Jong Park*, "AFCD: An Approximated-Fair and Controlled-Delay Queuing for High Speed Networks," in proceedings of the International Conference on Computer Communications and Networks (ICCCN 2013), pp.1-7, Nassau, Bahamas, 2013.
44. Lin Xue, Suman Kumar, Cheng Cui, *Seung-Jong Park*, "An Evaluation of Fairness Among Heterogeneous TCP Variants Over 10Gbps High-speed Networks," in proceedings of the 37th Annual IEEE Conference on Local Computer Networks (LCN 2012), pp. 348–351, Clearwater, FL, 2012.

45. Lin Xue, Cheng Cui, Suman Kumar, *Seung-Jong Park*, "Experimental Evaluation of the Effect of Queue Management Schemes on the Performance of High Speed TCPs in 10Gbps Network Environment," in the proceeding of the International Conference on Computing, Networking and Communications (ICNC 2012), pp. 315-319, Hawaii, USA, 2012.
46. Suman Kumar, Mohammed Azad, and *Seung-Jong Park*, "A fluid-based simulation study: the effect of loss synchronization on sizing buffers over 10Gbps high speed networks," in the proceeding of the 8th International Workshop on Protocols for Future, Large-Scale & Diverse Network Transports (PFLDNeT), Lancaster, PA, 2010.
47. Suman Kumar, *Seung-Jong Park*, and S. Sitharama Iyengar, "A Loss-Event Driven Scalable Fluid Simulation Method for High Speed Networks," in the Journal of Computer Networks, Elsevier, Volume 54, Issue 1, pp.112-132, 2010.
48. Yixin Wu, Suman Kumar, and *Seung-Jong Park*, "Measurement and Performance Issues of Transport Protocols over 10Gbps High Speed Optical Networks," in the Journal of Computer Networks, Elsevier, Volume 54, Issue 3, pp.475-488, 2010.
49. Suman Kumar, *Seung-Jong Park*, S. Iyengar, and J.-H. Kimn, "Time-Adaptive Numerical Simulation for High Speed Networks," in the Proceeding of High Performance Computing, Networking and Communication System (HPCNCS-07), pp.198-205, Orlando, FL, 2007.
50. L. Battestilli, A. Hutanu, G. Karmous-Edwards, D. Katz, J. MacLaren, J. Mambretti, H. Moore, *Seung-Jong Park*, H. Perros, S. Sundar, S. Tanwir, S. Thorpe, and Y. Xin, "EnLIGHTened Computing: An Architecture for Co-allocating Network, Compute, and other Grid Resources for High-End Applications," in the Proceeding of IEEE 4th International Symposium on High Capacity Optical Networks and Enabling Technologies (HONET 2007), Dubai, UAE, pp.1-8, November 2007.

Developing Wireless Networks and Protocols

51. *Seung-Jong Park* and R. Sivakumar, "Congestion-Aware Topology Controls for Wireless Multi-hop Networks," in the Journal of Ad-hoc Networks, Elsevier, Volume 8, Issue 3, pp.295-312, 2010.
52. Suman Kumar and *Seung-Jong Park*, "Probability Model for Data Redundancy Detection in Sensor Networks," in the Journal of the Mobile Information Systems, Volume 5, Number 2, pp.195-204, 2009.
53. Yixin Wu, Suman Kumar and *Seung-Jong Park*, "On Transport Protocol Performance Measurement over 10Gbps High Speed Optical Network," in the proceeding of the 18th International Conference on Computer Communications and Networks (ICCCN), pp.1-6, 2009.
54. *Seung-Jong Park* and R. Sivakumar, "Energy Efficient Correlated Data Aggregation for Wireless Sensor Networks," in the International Journal of Distributed Sensor Networks, Vol 4, Issue 1, pp.13-27, 2008.
55. Y. Zhu, R. Vedantham, *Seung-Jong Park* and R. Sivakumar, "A Scalable Correlation Aware Aggregation Strategy for Wireless Sensor Networks," Information Fusion, Volume 9, Issue 3, pp.354-369, 2008.
56. *Seung-Jong Park*, R. Vedantham, R. Sivakumar and I. Akyildiz, "GARUDA: Achieving Effective Reliability for Downstream Communication in Wireless Sensor Networks," in the journal of IEEE transactions on Mobile Computing, Volume 7, Number 2, pp.214-230, 2008.
57. Suman Kumar and *Seung-Jong Park*, "Estimating Data Redundancy in Sensor Networks," in the Proceeding of 3rd International Symposium on Innovations and Real Time Applications of Distributed Sensor Networks, Nov. 26-27, 2007, Shreveport, Louisiana.

58. R. Vedantham, *Seung-Jong Park* and R. Sivakumar, "Sink-to-Sensors Congestion Control," in the journal of Ad Hoc Networks, Elsevier, Volume 5, Number 4, pp.462-485, 2007.
59. Y. Zhou, Y. Yuan and *Seung-Jong Park*, "ACKNET, A Synthetic, Reliable, and Accurate Network Emulator over Long Fat Networks," in the Proceeding of the 17th Annual Argonne Symposium for Undergraduates in Science, Engineering and Mathematics, Nov. 2006.
60. *Seung-Jong Park* and R. Sivakumar, "An Energy Efficient Correlated Data Aggregation for Wireless Sensor Networks," in the Proceeding of 2nd International Symposium on Innovations and Real Time Applications of Distributed Sensor Networks, Washington DC, USA, Oct. 2006.
61. R. Vedantham, R. Sivakumar, and *Seung-Jong Park*, "Sink-to-Sensors Congestion Control," in the Proceeding of IEEE International Conference on Communications (ICC), Seoul, Korea, pp.3211-3217, May 2005.
62. Y. Zhu, R. Vedantham, *Seung-Jong Park* and R. Sivakumar, "A Scalable Correlation Aware Aggregation Strategy for Wireless Sensor Networks," in the Proceeding of IEEE International Conference on Wireless Internet (WICON), Budapest, Hungary, pp.122-129, July 2005.
63. S. S. Iyengar, G. Seetharaman, R. Kannan, A. Durresi, *Seung-Jong Park*, B. Krishnamachari, R. R. Brooks and J. Morrison, "Next Generation Distributed Sensor Networks," in Proceedings of Office of Naval Research, September 5-6, 2004, USA.
64. *Seung-Jong Park*, R. Vedantham, R. Sivakumar and I. Akyildiz, "A Scalable Approach for Reliable Downstream Data Delivery in Wireless Sensor Networks," in the Proceedings of ACM International Symposium on Mobile Ad hoc Networking and Computing (MOBIHOC) (acceptance rate: 9%), pp.78-89, Japan, May 2004.
65. V. Anantharaman, *Seung-Jong Park*, K. Sundaresan and R. Sivakumar, "TCP Performance over Mobile Ad-hoc Networks: A Quantitative Study," In the Journal of Wireless Communications and Mobile Computing Journal (WCMC), Volume 4, Issue 2, pp.203-222, Mar. 2004.
66. *Seung-Jong Park* and R. Sivakumar, "Sink-to Sensors Communication Reliability in Sensor Networks," ACM SIGMOBILE Mobile Computing and Communications Review, Volume 7, Issue 3, pp.27-28, July 2003.
67. *Seung-Jong Park* and R. Sivakumar, "Adaptive Topology Control for Wireless Ad-hoc Networks," ACM SIGMOBILE Mobile Computing and Communications Review, Volume 7, Issue 3, pp.37-38. July 2003.
68. *Seung-Jong Park* and R. Sivakumar, "Load-sensitive transmission power control in wireless ad-hoc network," in the Proceeding of IEEE Globecom, Volume 21, Number 1, pp.42-46, Taiwan, 2002.
69. *Seung-Jong Park* and R. Sivakumar, "Quantitative Analysis of Transmission Power Control in Wireless Ad-Hoc Network," in the Proceeding of International Workshop on Ad Hoc Networking, in conjunction with International Conference on Parallel Processing 2002, pp.56-63, Vancouver, Canada.
70. *Seung-Jong Park*, Dong-Woo Kim and C.-Y. Kim, "Optimal power allocation in CDMA forward link using dependencies between pilot and traffic channels," in the Proceeding of 50th IEEE Vehicular Technology Conference (VTC), pp.223-227, Sept. 1999, Amsterdam, The Netherlands.
71. Dong-Woo Kim, *Seung-Jong Park* and Jin-Woo Lee, "Scaling power up to resist SIR measurement error in CDMA mobile systems," in the Proceedings of CDMA International Conference (CIC), pp.419-422, 1998, Seoul, Korea.
72. *Seung-Jong Park* and Dong-Woo Kim, "Optimal channel separation in CDMA mobile systems," in the Proceeding of CDMA International Conference, pp.419-422, 1997, Korea.

73. *Seung-Jong Park*, et al, "Frequency coordination between adjacent carriers of two CDMA operators," in the Proceeding of 48th IEEE Vehicular Technology Conference, pp.1458-1461, 1996, Atlanta, GA, USA.
74. Seung-Joo Kim, *Seung-Jong Park* and Y.-H. Oh, "Complexity reduction method for vector sum excited linear prediction coding," in the Proceeding of International Conference on Spoken Language Processing, pp.2071-2074, 1994, Japan.

Book Chapters

75. Praveenkumar Kondikoppa, Chui-Hui Chiu and *Seung-Jong Park*, "MapReduce Performance in Federated Cloud Computing Environment," in the book of High Performance Cloud Auditing and Applications, Springer, pp.301-321, ISBN 978-1-4614-3296-8, 2014.
76. Suman Kumar and *Seung-Jong Park*, "On the Design and Analysis of Transport Protocols over Wireless Sensor Networks," in the book of Wireless Sensor Network," ISBN 978-3-902613-49-3, 2009.
77. S. Karthikeyan, *Seung-Jong Park* and R. Sivakumar, "Transport Layer Solutions for Ad-hoc Networks," in the book of Ad Hoc Networks: Technologies and Protocols, Springer, pp.123-152, 2004.

Edited Books

78. Soft Computing in Big Data Processing, Keon Myung Lee, *Seung-Jong Park*, Jee-Hyong Lee (Editors), Springer, ISBN 978-3-319-05526-8, 2014.

TEACHING

2025: CS 4010/6010: Seminars

2024: CS 6001: Special Topics: Advanced Bioinformatics
CS 4010/6010: Seminars

2020: CSC 4501: Computer Networks
CSC 3200: Ethics in Computing

2019: CSC 4501: Computer Networks
CSC 7700: Special Topic: Large-scale Deep Learning for Biomedical Research

2018: CSC 4501: Computer Networks
CSC 3200: Ethics in Computing

2017: CSC 4501: Computer Networks
CSC 7700: Special Topic: Data Science and Bioinformatics

2016: CSC 4501: Computer Networks

2015: CSC 4501: Computer Networks
CSC 4740: Big Data Technologies

2014: CSC 4501: Computer Networks

2013: CSC 4501: Computer Networks
CSC7700: Special Topics: Computational Biology

2012: CSC 4501: Computer Networks
CSC 7602: Wireless Networks

2011: CSC 4501: Computer Networks
CSC 7601:Design Issues of High Speed Optical Networks

2010: CSC 7201: Wireless Networks

2009: SYSC 7090: System Science Design Project
CSC 7999: Selected Readings in CS

2008: CSC 3501: Computer Organization and Design
CSC 3999: Independent Undergraduate Research

2007: CSC 7201: Wireless Networks
CSC 7202: Design Issues of High Speed Optical Networks

2006: CSC 7201: Wireless Networks
CSC 3501: Computer Organization and Design

2005: CSC 4501: Computer Networks

2004: CSC 4890: Introduction to Theory of Computation

Ph.D. Thesis

Richard Plantania	2019
Shayan Sham	2019
Sayan Goswami	2019
Arghya Kusun Das	2018
Chui-Hui Chiu	2017
Praveenkumar Kondikipa	2014
Lin Xue	2014
Shuju Bai	2013
Cheng Cui	2013
Suman kumar	2009

M.S. Thesis

Georgi Stoyanov	2014

Umesh Satish	2013
Vishwanadh Raparthi	2011
Gayathri Namala	2010
Yixin Wu	2008
Yaaser Mohammed	2006

PROFESSIONAL SERVICE

University Service

- University Faculty Senate representing the College of Engineering (elected since 2020)
- College of Engineering Promotion and Tenure committee representing the Computer Science and Engineering (elected in 2016, 2018)
- College of Engineering Policy committee representing the Computer Science and Engineering (elected since 2015)
- Dean's representative (since 2004)
- Chairs / members of faculty search committees (since 2010-2019) to hire more than 10 faculties, including three female faculties
- Chairs / members of Master/Ph.D. admission committees (since 2005)
- Chairs / members of Promotion & Tenure committees (since 2010)
- Departmental News committees (2005 – 2008)
- Undergraduate Curriculum committees (2006 – 2010, 2016 – 2018)

National / Discipline-based

- NSF Review Panels (since 2007)
- Review Panel for the Broadband Technology Opportunities Program (BTOP) of National Telecommunications and Information Agency (NTIA) of the US Department of Commerce, 2009
- Co-chair on the federal interagency committee for Middleware and Grid Interagency Coordination (MAGIC) under Networking and Information Technology Research and Development (NITRD).

Conference Organizing Committees

- Technical Program Committee, 2024, IEEE/ACM Supercomputing (SC) Conference
- General Chair, 2019 International Conference on Big Data, Service Conference Federation
- Technical Program Committee, 2013 & 2014 International Conference on Computer Communications and Networks (ICCCN)
- Technical Program Committee, 2013 & 2014 IEEE Globecom.
- Technical Program Committee, 2012 & 2013 International Conference on Communications (ICC)
- Technical Program Committee, 2010 IEEE 71st Vehicular Technology Conference
- Technical Program Committee, IEEE Cluster 2009.
- Session Chair, 18th International Conference on Computer Communications and Networks (ICCCN) 2009.

- Publication Chair, 2007 3rd International Symposium of Innovations and Real-Time Applications of Distributed Sensor Networks.
- Technical Program Committee, 2006 3rd International Conference on Broadband Communications, Networks, and Systems.
- Publicity Chair, 2006 2nd International Symposium of Innovations and Real-Time Applications of Distributed Sensor Networks.
- Publicity Chair, SenMetrics: 2005, Third International Workshop on Measurement, Modeling, and Performance Analysis of Wireless Sensor Networks.
- Poster Session and Local Organizing Committee, 2005, 13th Annual Mardi Gras Conference, Frontiers of Grid Applications and Technologies.