Kwang-Sung Jun

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Education

University of Wisconsin-Madison, awarded August 2015.	**Madison, WI**
Ph.D. Computer Sciences	*2009–2015*

Advisor: Dr. Xiaojin (Jerry) Zhu

Dissertation: Some Machine Learning Methods from Sequential Input

University of Wisconsin-Madison, awarded December 2011.	**Madison, WI**
M.S. Computer Sciences	*2009–2011*
Soongsil Univeristy	**Seoul, South Korea**
B.E. Computing (Summa cum Laude); minor in Mathematics, awarded June 2009.	*2003–2009*

Employment

University of Arizona	**Tucson, AZ**
Assistant Professor, Department of Computer Science	*August 2019–current*

Boston University	**Boston, MA**
Postdoctoral Associate, Hariri Institute	*September 2018–July 2019*

Advisor: Dr. Francesco Orabona

University of Wisconsin-Madison	**Madison, WI**
Postdoctoral Associate, Wisconsin Institute for Discovery	*August 2015–July 2018*

Advisors: Drs. Robert Nowak, Rebecca Willett, and Stephen Wright

Honors and Awards

Top 10% reviewer, International Conference on Machine Learning (ICML), 2022.

Top 10% reviewer, International Conference on Artificial Intelligence and Statistics (AISTATS), 2022.

Top 8% reviewer, Neural Information Processing Systems (NeurIPS), 2021.

Travel Grants, International Conference on Machine Learning (ICML), 2013.

Doctoral Study Abroad Scholarship from The Korea Foundation of Advanced Studies, 2009-2014.

Alumni Scholarship, Department of Computer Sciences, University of Wisconsin-Madison, 2009.

Korean Broadcasting System (KBS) Science and Engineering Human Resource Development Scholarship, 2009.

Service/Outreach

Local/State Outreach

- Panelist on the future of AI at The Loft Cinema, Tucson AZ, May 2023.
- Panelist on "What is Data Science?" at Research Bazaar Arizona, Tucson AZ, May 2021.
- Mentor for Women in STEM Mentorship Program (Mentee: Nuzhat Mastura, first year CS), September 2020 - April 2021.

Departmental Committees

- Tenure-Track Faculty Recruiting Committee: Member (2024 Spring)
- Departmental Statistics Committee: Chair (2023 Fall - 2024 Spring).
- Graduate Recruiting and Admissions Committee: Member (2019-2020, 2021-2022, 2022-2023).
- Awards Committee: Member (Spring 2023).
- Data science MS Implementation Committee: Chair (Fall 2022).
- Tenure Track Faculty Recruiting Committee: Member (2020-2021).
- Comprehensive Exam Committee: Manujinda Wathugala (May 2022), Hao Qian (Dec 2023), Alonso (Dec 2023), Yichen Li (Dec 2023), Mahdi Rahimi (Dec 2023).
- Dissertation Committee: Chinmai Basavaraj (December 2021).

Other committees: External Committees

- Dissertation Committee: Bingshan Hu (University of British Columbia; September 2021)
- UA SIE (Systems and Industrial Engineering) Tenure Track Faculty Recruiting Committee (2020-2021).

Proposal reviews

- ARO (Army Research Office) proposal review, 2022.
- NSF CISE Panel review, 2021.

Conference reviews

- NeurIPS (Neural Information Processing Systems): Area Chair (2023), Program Committee (2016-2023).
- ICML (International Conference on Machine Learning): Program Committee 2016-2024.
- COLT (Conference on Learning Theory): Senior Program Committee (Area Chair) 2023-2024, Reviewer 2017-2022.
- AISTATS (International Conference on Artificial Intelligence and Statistics): Program Committee 2017-2024.
- ALT (Algorithmic Learning Theory): Senior Program Committee (Area Chair) 2024.
- AAAI (Association for the Advancement of Artificial Intelligence): Area Chair (Equivalent to Senior Area Chair) 2023, Senior Program Committee 2020-2022, Program Committee 2018.

Journal editor

- Action editor of the journal *Machine Learning* (2024).

Journal reviews (YYYY(N) means reviewed N papers in year YYYY.)

- Information and Inference: A Journal of the IMA: 2020(1), 2023(1)
- IEEE Transactions on Information Theory: 2023(1).
- IEEE Transactions on Signal Processing: 2019(1).
- IEEE Transactions on Neural Networks and Learning Systems: 2019(1), 2020(1).
- Machine Learning: 2020(1), 2021(2).
- IEEE Transactions on Pattern Analysis and Machine Intelligence: 2020(1), 2021(1).
- IEEE Journal on Selected Areas in Information Theory: 2021(1)
- IEEE Open Journal of Control Systems, 2022(1)

Other service

- A co-host for (virtual) RL theory seminar (Osama A. Hanna's talk, 2023).

Publications

*: work substantially based on work done as a graduate student.
<u>Underline</u>: PhD advisees or postdoctoral mentees.

Book Chapters

Kwang-Sung Jun, Robert Nowak. "Bayesian Active Learning on Graphs." Chapter 10 in *Cooperative and Graph Signal Processing*, Petar Djuric and Cedric Richard, Eds., Elsevier, pp.283-297 2018.

Journal Articles

Francesco Orabona, **Kwang-Sung Jun**. "Tight concentrations and confidence sequences from the regret of universal portfolio." *IEEE Transactions on Information Theory*, vol. 70, no. 1, pp. 436-455, 2024.

Kwang-Sung Jun, Francesco Orabona, Rebecca Willett, Stephen Wright. "Online Learning for Changing Environments using Coin Betting." *Electronic Journal of Statistics (EJS)*, 11(2), 5282–5310, 2017.

Peer-Reviewed Conferences

Junghyun Lee, Se-Young Yun, **Kwang-Sung Jun**. "Improved Regret Bounds of (Multinomial) Logistic Bandits via Regret-to-Confidence-Set Conversion." In *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2024.

Hao Qin, **Kwang-Sung Jun**, Chicheng Zhang. "Kullback-Leibler Maillard Sampling for Multi-armed Bandits with Bounded Rewards." In *Neural Information Processing Systems (NeurIPS)*, 2023.

<u>Kyoungseok Jang</u>, **Kwang-Sung Jun**, Ilja Kuzborskij, Francesco Orabona (alphabetical order). "Tighter PAC-Bayes Bounds Through Coin-Betting." In *Proceedings of the Conference on Learning Theory (COLT)*, PMLR 195:2240-2264, 2023.

<u>Yao Zhao</u>, Connor Stephens, Csaba Szepesvári, **Kwang-Sung Jun**. "Revisiting Simple Regret Minimization in Multi-Armed Bandits." In *Proceedings of the International Conference on Machine Learning (ICML)*, PMLR 202:42110-42158, 2023.

<u>Kyoungseok Jang</u>, Chicheng Zhang, **Kwang-Sung Jun**. "PopArt: Efficient Sparse Regression and Experimental Design for Optimal Sparse Linear Bandits." In *Neural Information Processing Systems (NeurIPS)*, 35:2102-2114, 2022.

Yeoneung Kim, Insoon Yang, **Kwang-Sung Jun**. "Improved Regret Analysis for Variance-Adaptive Linear Bandits and Horizon-Free Linear Mixture MDPs." In *Neural Information Processing Systems (NeurIPS)*, 35:1060-1072, 2022.

Louis Faury, Marc Abeille, **Kwang-Sung Jun**, Clément Calauzènes. "Jointly Efficient and Optimal Algorithms for Logistic Bandits." In *International Conference on Artificial Intelligence and Statistics (AISTATS)*, PMLR 151:546-580, 2022.

<u>Spencer Brady Gales</u>, Sunder Sethuraman, **Kwang-Sung Jun**. "Norm-Agnostic Linear Bandits." In *International Conference on Artificial Intelligence and Statistics (AISTATS)*, PMLR 151:73-91, 2022.

<u>Jie Bian</u>, **Kwang-Sung Jun**. "Maillard Sampling: Boltzmann Exploration Done Optimally." In *International Conference on Artificial Intelligence and Statistics (AISTATS)*, PMLR 151:54-72, 2022.

Blake Mason, **Kwang-Sung Jun**, Lalit Jain. "An Experimental Design Approach for Regret Minimization in Logistic Bandits." In *AAAI Conference on Artificial Intelligence (AAAI)*, 36(7):7736-7743, 2022.

Kwang-Sung Jun, Lalit Jain, Blake Mason, Houssam Nassif. "Improved Confidence Bounds for the Linear Logistic Model and Applications to Bandits." In *International Conference on Machine Learning (ICML)*,

PMLR 139:5148-5157, 2021.

Kyoungseok Jang, **Kwang-Sung Jun**, Se Young Yun, Wanmo Kang. "Improved Regret Bounds of Bilinear Bandits using Action Space Dimension Analysis." In *International Conference on Machine Learning (ICML)*, PMLR 139:4744-4754, 2021.

Hyejin Park, Seiyun Shin, **Kwang-Sung Jun**, Jungseul Ok. "Transfer Learning in Bandits with Latent Continuity." In *IEEE International Symposium on Information Theory (ISIT)*, pp. 1463-1468, 2021.

Kwang-Sung Jun, Chicheng Zhang "Crush Optimism with Pessimism: Structured Bandits Beyond Asymptotic Optimality." In *Neural Information Processing Systems (NeurIPS)*, 33:6366-6376, 2020.

Kwang-Sung Jun, Ashok Cutkosky, Francesco Orabona. "Kernel Truncated Randomized Ridge Regression: Optimal Rates and Low Noise Acceleration." In *Neural Information Processing Systems (NeurIPS)*, 32:15332-15341, 2019.

Kwang-Sung Junand Francesco Orabona. "Parameter-Free Online Convex Optimization with Sub-Exponential Noise." In *Proceedings of the Conference on Learning Theory (COLT)*, PMLR 99:1802-1823, 2019.

Kwang-Sung Jun, Rebecca Willett, Stephen Wright, Robert Nowak. "Bilinear Bandits with Low-rank Structure." In *Proceedings of the International Conference on Machine Learning (ICML)*, PMLR 97:3163-3172, 2019.

Kwang-Sung Jun, Lihong Li, Yuzhe Ma, Xiaojin Zhu. "Adversarial Attacks on Stochastic Bandits." In *Neural Information Processing Systems (NeurIPS)*, 31:3644-3653, 2018.

Yuzhe Ma, **Kwang-Sung Jun**, Lihong Li, Xiaojin Zhu. "Data Poisoning Attacks in Contextual Bandits." In *Conference on Decision and Game Theory for Security (GameSec)*, 9:186-204, 2018.

Kwang-Sung Jun, Aniruddha Bhargava, Robert Nowak, Rebecca Willett. "Scalable Generalized Linear Bandits: Online Computation and Hashing." In *Advances in Neural Information Processing Systems (NeurIPS)*, 30:99-109, 2017.

Xiaozhu Meng, Barton P. Miller, **Kwang-Sung Jun**. "Identifying Multiple Authors in a Binary Program." In *European Symposium on Research in Computer Security (ESORICS)*, Part II 22:286-304, 2017.

Kwang-Sung Jun, Francesco Orabona, Rebecca Willett, Stephen Wright. "Improved Strongly Adaptive Online Learning using Coin Betting." In *The International Conference on Artificial Intelligence and Statistics (AISTATS)*, PMLR 54:943-951, 2017. (**Oral presentation** 28/168=16.7%)

Kwang-Sung Jun, Robert Nowak. "Graph-Based Active Learning: A New Look at Expected Error Minimization." In *In IEEE GlobalSIP Symposium on Non-Commutative Theory and Applications*, pp. 1325-1329, 2016.

Jeffrey Zemla, Yoed Kenett, **Kwang-Sung Jun**, Joseph Austerweil. "U-INVITE: Estimating Individual Semantic Networks from Fluency Data." In *Proceedings of the 38th Annual Meeting of the Cognitive Science Society*, Volume 1(1):35-58, 2016.

Kwang-Sung Jun, Robert Nowak. "Anytime Exploration for Multi-armed Bandits using Confidence Information." In *Proceedings of the International Conference on Machine Learning (ICML)*, PMLR 48:974-982, 2016.

Kwang-Sung Jun[*], Kevin Jamieson, Robert Nowak, Xiaojin Zhu. "*Top Arm Identification in Multi-armed Bandits with Batch Arm Pulls." In *The International Conference on Artificial Intelligence and Statistics (AISTATS)*, PMLR 51:139-148, 2016.

Kwang-Sung Jun*, Xiaojin Zhu, Timothy Rogers, Zhuoran Yang, Ming Yuan. "Human Memory Search as Initial-visit Emitting Random Walk." In *Advances in Neural Information Processing Systems (NeurIPS)*, 28:1072-1080, 2015.

Kwang-Sung Jun*, Xiaojin Zhu, Burr Settles, Timothy Rogers. "Learning from Human-Generated Lists." In *Proceedings of the International Conference on Machine Learning (ICML)*, PMLR 28(3):181-189, 2013.

Jun-Ming Xu, **Kwang-Sung Jun***, Xiaojin Zhu, Amy Bellmore. "Learning from Bullying Traces in Social Media." In *North American Chapter of the Association for Computational Linguistics - Human Language Technologies (NAACL-HLT)*, pp. 656-666, 2012.

Xiaojin Zhu, Bryan R. Gibson, **Kwang-Sung Jun***, Timothy T. Rogers, Joseph Harrison, and Chuck Kalish. "Cognitive models of test-item effects in human category learning." In *Proceedings of the International Conference on Machine Learning (ICML)*, 27:1247-1254, 2010.

Kwang-Sung Junand Kyu-Baek Hwang. "An efficient collaborative filtering method based on k-nearest neighbor learning for large-scale data." In *Proceedings of Korea Computer Congress*, pp. 376-380, 2008.

Workshops & Technical Reports

Kwang-Sung Jun, Chicheng Zhang "Crush Optimism with Pessimism: Structured Bandits Beyond Asymptotic Optimality." In ICML Workshop on Theoretical Foundations of Reinforcement Learning, 2020. (**Oral presentation**)

Kwang-Sung Jun, Francesco Orabona. "Parameter-Free Locally Differentially Private Stochastic Subgradient Descent." In *NeurIPS Workshop on Privacy in Machine Learning (PriML)*, 2019.

Kayla Jacobs, **Kwang-Sung Jun**, Nathan Lieby, Elena Eneva. "*Smarter Crisis Crowdsourcing." In *ACM SIGKDD Workshop on Data Science for Social Good*, 2014.

Michael Maynord, Jitrapon Tiachunpun, Xiaojin Zhu, Charles R. Dyer, **Kwang-Sung Jun**, Jake Rosin. "*An Image-To-Speech iPad App." In *Department of Computer Sciences Technical Report TR1774, University of Wisconsin-Madison*, 2012.

Bryan R. Gibson, **Kwang-Sung Jun**, Xiaojin Zhu. "*With a little help from the computer: Hybrid human-machine systems on bandit problems." In *NeurIPS Workshop on Computational Social Science and the Wisdom of Crowds*, 2010.

Conferences/Scholarly Presentations

Excluded poster presentations from conferences.

Seminars

- "Recent advances of interactive machine learning in the data-poor regime," KAIST Graduate School of Data Science, Aug 2023.
- "Revisiting Simple Regret in Multi-Armed Bandits: Fast Rates for Returning a Good Arm," {Seoul National University, KAIST School of Computing}, Aug 2023.
- "Maillard Sampling: Boltzmann Exploration Done Optimally," Chung-Ang University, South Korea, June 2023.
- "PopArt: Efficient Sparse Regression and Experimental Design for High- Dimensional Interactive Machine Learning," Missouri University of Science and Technology, September 2022.
- "PopArt: Efficient Sparse Regression and Experimental Design for High- Dimensional Interactive Machine Learning," Seoul National University, South Korea, July 2022.
- "Maillard Sampling: Boltzmann Exploration Done Optimally," {Korea Advanced Institute of Science

and Technology, Pohang University of Science and Technology, Korea Advanced Institute of Science and Technology, Seoul National University}, South Korea, June 2022.

- ○ "Maillard Sampling: Boltzmann Exploration Done Optimally," RL Theory Seminars (Virtual), May 2022.
- ○ "Maillard Sampling for Interactive Machine Learning: Boltzmann Exploration Done Optimally", TRIPODS Seminar, University of Arizona, April 2022.
- ○ "Recent Developments on Logistic Linear Bandits," {Ulsan National Institute of Science and Technology, Pohang University of Science and Technology, Korea Advanced Institute of Science and Technology, Seoul National University}, South Korea, June 2021.
- ○ "Crush Optimism with Pessimism: Structured Bandits Beyond Asymptotic Optimality," RL Theory Seminars (Virtual), July 2020.
- ○ "Accelerating discovery rate in adaptive experiments via bandits with low-rank structure", TRIPODS RWG6 Seminar, University of Arizona, September 2019.
- ○ "Adaptive data collection for accelerating discovery rates", TRIPODS Seminar, University of Arizona, September 2019.

Symposia and Workshops

- ○ Tutorial: "Recent Developments of Interactive Machine Learning using Bandit Algorithms," SAARC Workshop on Mathematics and Machine Learning at Korea Advanced Institute of Science and Technology, South Korea, August 2021.
- ○ "Crush Optimism with Pessimism: Structured Bandits Beyond Asymptotic Optimality," at ICML'20 workshop on theoretical foundations of reinforcement learning, July 2020.

Conferences

- ○ "Adaptive data collection for accelerating discovery rates", Arizona Days Conference, May 2019.

Others

- ○ "Interactive Machine Learning," Visiting Weekend, University of Arizona, March 2023.
- ○ Guest lecture in Math 586B, "Recent Developments of Interactive Machine Learning using Bandit Algorithms", University of Arizona, February 2022.
- ○ "Accelerating discovery rate in adaptive experiments via bandits with low-rank structure", Microsoft, Cambridge, MA, July 2019.
- ○ "Accelerating discovery rate in adaptive experiments via bandits with low-rank structure", University of Arizona, Tucson, AZ, April 2019.
- ○ "Adapting to changing environments in online learning", Boston University, Open AIR: Industry Open House, Boston, MA, October 2018.
- ○ "Scalable Generalized Linear Bandits: Online Computation and Hashing", University of Wisconsin-Madison, Madison, WI, October 2017.
- ○ "Multi-Armed Bandit Algorithms and Applications to Experiment Selection", University of Wisconsin-Madison, Center for Predictive Computational Phenotyping Annual Retreat, Madison, WI, June 2016.
- ○ "Top Arm Identification in Multi-Armed Bandits with Batch Arm Pulls", University of Wisconsin-Madison, Madison, WI, March, 2016.
- ○ "Measuring semantic structure from verbal fluency data with the initial-visit-emitting (INVITE) random walk", University of Wisconsin-Madison, Madison, WI, November, 2015.
- ○ "Learning from Human-Generated Lists", Toyota Technological Institute at Chicago, Chicago, IL, March, 2015.

Awarded Grants and Contracts

Federal

○ "CIF: Small: Theory and Algorithms for Efficient and Large-Scale Monte Carlo Tree Search." 100% one Summer month, PI Kwang-Sung Jun, NSF CIF, $599,238, 2023-2026.

Intramural

○ "Sequential Decision-Making Algorithms for Accelerated Materials Science.", PI Kwang-Sung Jun, Research, Innovation & Impact, University of Arizona. $15,000, 2023.

○ "Data-Driven Risk Assessment and Mitigation for Post-Fire Debris Flows." PI Kwang-Sung Jun, Co-PI Luke McGuire, Data Science Academy, University of Arizona. $28,521, 2022.

○ "Provably Efficient Adaptive Monte Carlo Methods." PI Kwang-Sung Jun, Research, Innovation & Impact, University of Arizona. $27,890, 2022.

Advising

PhD advisee: Yao Zhao (CS, 2020-), Kapilan Balagopalan (CS, 2022-) Tuan Nguyen (CS, 2022-), Spencer Brady Gales (Applied Math, 2020-2022), Jie Bian (CS, 2020-2022; had to quit due to a visa issue by Proclamation 10043 set by the former president Donald Trump)

Postdoc mentee: Kyoungseok Jang (March 2022-)

Minor advisee: Yeshuai He (SIE), Amanda Triplett (Hydrology), Minhang Zhou (SIE), Shunyu Yao (SIE), Amir Hossein Yazdani Abyaneh (ECE), Guangyu Hu (Materials Science)

Undergraduate research: Benjamin Koppe (CS, 2023-), Hari Gopal Krishnan (2020-2022)

Industry Experience

Eric and Wendy Schmidt's Data Science for Social Good　　　　　　　　　**Chicago, IL**
Fellow　　　　　　　　　*Summer 2013*
Supervisor: Elena Eneva and Rayid Ghani
Project: "Smarter Crisis Crowdsourcing." Developed natural language processing tools for automatic event tagging (e.g., categorization) in a crisis crowdsourcing framework.

@WalmartLabs　　　　　　　　　**San Bruno, CA**
Member of Technical Staff Internship　　　　　　　　　*Summer 2012*
Supervisor: Yannis Pavlidis
Project: "Personal Event Detection in Twitter"

Robert Bosch LLC　　　　　　　　　**Palo Alto, CA**
Research Internship　　　　　　　　　*Summer 2011*
Supervisor: Dr. Soundar Srinivasan
Project: "Data Mining for Smart Medical Logic"

Teaching

University of Arizona　　　　　　　　　**Tucson, AZ, USA**
Computer Science Department

CSC588 Machine Learning Theory	Spring 2024
CSC696H Topics in Concentration of Measure	Fall 2023
CSC588 Machine Learning Theory	Spring 2023
CSC380 Principles of Data Science	Fall 2022
CSC380 Principles of Data Science	Spring 2022
CSC580 Principles of Machine Learning	Fall 2021
CSC580 Principles of Machine Learning	Fall 2020
CSC665 Online Learning and Multi-armed Bandits	Spring 2020

References

Available upon request.