

Beomyeol Jeon

CONTACT INFORMATION	1201 E Florida Avenue Apt 32B Urbana, IL 61801 +1-217-417-9816	bj2@illinois.edu beomyeol.github.io beomyeol beomyeol
RESEARCH INTERESTS	Systems for Machine Learning, Distributed Systems, Machine Learning, Cloud Computing	
EDUCATION	University of Illinois Urbana-Champaign , Urbana, IL <i>Ph.D. Candidate in Computer Science</i> <ul style="list-style-type: none">GPA: 3.97/4.0 Seoul National University , Seoul, Korea <i>B.S. in Computer Science and Engineering (summa cum laude)</i> <ul style="list-style-type: none">GPA: 4.0/4.3 (Overall), 4.19/4.3 (Major) The University of Texas at Austin , Austin, TX <i>Undergraduate Exchange Student in Computer Science</i> <ul style="list-style-type: none">GPA: 3.91/4.0	Aug 2016 — present Mar 2008 — Feb 2016 Jan 2015 — May 2015
PUBLICATIONS	<ul style="list-style-type: none">[1] Beomyeol Jeon, Yongjoo Park, Indranil Gupta. <i>Automating Resource Allocation for Graph Neural Network Training on Serverless Frameworks</i>, Currently Under Preparation, 2024.[2] Beomyeol Jeon, Chen Wang, Diana Arroyo, Alaa Youssef, Indranil Gupta. <i>SLO-aware ML Inference Autoscaler for Fixed-Size On-Premises Clusters</i>, Under Review at a Conference, 2024.[3] Beomyeol Jeon*, S M Ferdous*, Muntasir Raihan Rahman, Anwar Walid. <i>Privacy-preserving Decentralized Aggregation for Federated Learning</i>. The 1st International Workshop on Distributed Machine Learning and Fog Network (FOGML 2021) (co-located with INFOCOM 2021), May 2021. [link, code, extended version][4] Beomyeol Jeon, Linda Cai, Pallavi Srivastava, Jintao Jiang, Xiaolan Ke, Yitao Meng, Cong Xie, Indranil Gupta. <i>Baechi: Fast Device Placement of Machine Learning Graphs</i>. ACM Symposium on Cloud Computing 2020 (SoCC 2020), October 2020. (Acceptance rate: $35/143 = 24\%$) [link, code, extended version][5] Woo-Yeon Lee, Yunseong Lee, Joo Seong Jeong, Gyeong-In Yu, Joo Yeon Kim, Ho Jin Park, Beomyeol Jeon, Wonwook Song, Gunhee Kim, Markus Weimer, Brian Cho, Byung-Gon Chun. <i>Automating System Configuration of Distributed Machine Learning</i>. 39th International Conference on Distributed Computing Systems (ICDCS 2019), July 2019. [link, code][6] Byung-Gon Chun, Tyson Condie, Yingda Chen, Brian Cho, Andrew Chung, Carlo Curino, Chris Douglas, Matteo Interlandi, Beomyeol Jeon, Joo Seong Jeong, Gye-Won Lee, Yunseong Lee, Tony Majestro, Dahlia Malkhi, Sergiy Matushevych, Brandon Myers, Mariia Mykhailova, Shravan Narayanamurthy, Joseph Noor, Raghu Ramakrishnan, Sriram Rao, Russell Sears, Beysim Sezgin, Tae-Geon Um, Julia Wang, Markus Weimer, Youngseok Yang. <i>Apache REEF: Retainable Evaluator Execution Framework</i>. ACM Transactions on Computer Systems (TOCS), Volume 35 Issue 2, October 2017. [link][7] Byung-Gon Chun, Brian Cho, Beomyeol Jeon, Joo Seong Jeong, Gunhee Kim, Joo Yeon Kim, Woo-Yeon Lee, Yun Seong Lee, Markus Weimer, Gyeong-In Yu.	

Dolphin: Runtime Optimization for Distributed Machine Learning. ICML ML Sys '16 workshop, June 2016. [[link](#)]

SKILLS

Languages and Techniques

- Programming Languages: C/C++, Python, Go, Java, C#
- ML Frameworks: TensorFlow, PyTorch, Ray, Pandas, Scikit-learn, Darts
- Libraries: Boost, Eigen, Protocol Buffers, MessagePack, Cap'n Proto, ZeroMQ
- Cloud Related Skills: Kubernetes, Docker, AWS EC2, AWS Lambda,

RESEARCH EXPERIENCE

Distributed Protocols Research Group, UIUC

Aug 2016 — present

Graduate Research Assistant

Advisor: Prof. Indranil Gupta

- Worked on a new fault tolerance technique for distributed machine learning systems and implemented it on top of Apache MXNet.
- Worked on an algorithmic approach to the fast operator placement of ML graphs in memory-constrained environments: Baechi (in SoCC 2020).
 - Baechi generates ML graph placements $654\times-206K\times$ faster than the state-of-the-art RL-based approaches, and the placement quality is comparable to the expert-based placements.
 - GitHub link: <https://github.com/beomyeol/baechi>
 - Skills: TensorFlow, Python, Docker
- Worked on an intelligent SLO-aware autoscaling framework for ML inference jobs on multi-tenant fix-sized containerized clusters by collaborating with IBM Research (Under Review).
 - Our approach achieves $1.7\times-22\times$ lower SLO violations compared to state-of-the-art systems.
 - GitHub link: <https://github.com/beomyeol/k8s-ray-py> (Private)
 - Skills: Python, Go, Kubernetes, Ray, PyTorch, Pandas, Docker, Scikit-learn
- Working on an automatic system configuration optimization framework for Graph Neural Network (GNN) training on serverless frameworks, e.g., AWS Lambda (Ongoing work).
 - GitHub link: <https://github.com/beomyeol/serverless-gnn-cpp> (Private)
 - Skills: C++, C#, Go, AWS Lambda, ZeroMQ, Protocol buffer, MessagePack, Cap'n Proto, Boost

Software Platform Lab, Seoul National University

Jul 2015 — Jun 2016

Undergraduate Research Intern

Advisor: Prof. Byung-Gon Chun

- Designed and implemented a deep neural network module for Dolphin, an open-source distributed machine learning platform built on top of Apache REEF.
 - GitHub link: <https://github.com/snuspl/dolphin>
 - Skills: Java, Apache REEF
- Worked on performance modeling and an optimization tool to find an optimal configuration for distributed machine learning systems: Cruise (in IDCDS 2019).
 - GitHub link: <https://github.com/snuspl/cruise>
 - Skills: Java, Apache REEF

	Database Systems Lab, Seoul National University Sep 2014 — Dec 2014 <i>Undergraduate Research Intern</i> Advisor: Prof. Bongki Moon <ul style="list-style-type: none"> Worked on the performance improvement of H-Store, a distributed in-memory database, with NVMe SSD. Worked on the performance improvement of MongoDB for trajectory data.
WORK EXPERIENCE	Nokia Bell Labs , Murray Hill, NJ Jun 2019 — Aug 2019 <i>Research Intern</i> Mentor: Dr. Muntasir Raihan Rahman & Dr. Anwar Walid <ul style="list-style-type: none"> Worked on designing a privacy-preserving decentralized aggregation protocol for federated learning: SecureD-FL (in FOGML 2021) (Extended version). <ul style="list-style-type: none"> GitHub link: https://github.com/beomyeol/SecureD-FL Skills: Python, PyTorch
	Google , Kirkland, WA May 2018 — Aug 2018 <i>Software Engineering Intern, BigQuery Team</i> Mentor: Dr. Mohsen Vakilian <ul style="list-style-type: none"> Built a tool for automatically tuning BigQuery system configuration parameters to achieve better performance (e.g., query processing time) by using a machine learning tool called Google Vizier. <ul style="list-style-type: none"> Skills: Python
	Google , Mountain View, CA May 2017 — Aug 2017 <i>Software Engineering Intern, Google Earth Engine Team</i> Mentor: Dr. Hector Gonzalez <ul style="list-style-type: none"> Designed and built a framework for large-scale GIS batch computation on top of Google Cloud Dataflow from scratch. <ul style="list-style-type: none"> Skills: C++
	Somansa , Seoul, Korea Jan 2011 — Dec 2013 <i>Researcher</i> <ul style="list-style-type: none"> Developed a network data loss prevention (DLP) solution, Mail-i, and a database audit and protection (DAP) solution, DB-i, by analyzing network packets. <ul style="list-style-type: none"> Skills: C++, Boost
TEACHING EXPERIENCE	University of Illinois Urbana-Champaign <i>Graduate Teaching Assistant</i> <ul style="list-style-type: none"> CS 425/ECE 428: Distributed Systems Spring 2018, Fall 2018, Fall 2019 CS 525: Advanced Distributed Systems Spring 2021
PROFESSIONAL SERVICES	ISSRE 2019 <i>Subreviewer</i> Transactions on Cloud Computing (TCC) 2019 <i>Reviewer</i> Transactions on Computers (TC) 2021 <i>Reviewer</i>
AWARDS & HONORS	The National Scholarship for Science and Engineering 2008 — 2010, 2014, 2015 <ul style="list-style-type: none"> Full tuition funded by <i>Korea Student Aid Foundation</i> Outgoing Exchange Student Program Scholarship Spring 2015 <ul style="list-style-type: none"> \$2,000 funded by the <i>Office of International Affairs</i> at Seoul National University
REFERENCES	Available upon requests