Namyong Park

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Research Interests

Graph Learning, Machine Learning, Knowledge Reasoning, Large Language Models, Representation Learning, Efficient Deep Learning

Current Position

Meta AI   Menlo Park, CA
Postdoctoral Researcher   Oct 2022–*Present*
- Developing methods for efficient and scalable learning of graph neural networks (GNNS) and large language models (LLMs), such as memory-efficient fine-tuning of LLMs, graph representation learning via forward-only (i.e., backpropagation-free) learning, and automatic hyperparameter tuning via meta-learning.

Education

Carnegie Mellon University   Pittsburgh, PA
Ph.D. in Computer Science   2017–2022
- Ph.D. Thesis: Mining and Learning with Graphs and Tensors
- Thesis Committee: Prof. Christos Faloutsos (Advisor), Prof. Tom Mitchell, Prof. Leman Akoglu, and Dr. Xin Luna Dong

Seoul National University   Seoul, Korea
M.S. in Computer Science and Engineering   2013
- Advisor: Prof. Robert Ian (Bob) McKay

Seoul National University   Seoul, Korea
B.S. in Computer Science and Engineering   2010
- Honors: *summa cum laude*

Publications and Preprints

[1] **Large Graph Generative Models**.
arXiv, abs/2406.05109, 2024.
Yu Wang, Ryan Rossi, **Namyong Park**, Huiyuan Chen, Nesreen Ahmed, Puja Trivedi, Franck Dernoncourt, Danai Koutra, and Tyler Derr.

[2] **Editing Partially Observable Networks via Graph Diffusion Models**.
International Conference on Machine Learning (ICML), 2024.
Puja Trivedi, Ryan Rossi, David Arbour, Tong Yu, Franck Dernoncourt, Sungchul Kim, Nedim Lipka, **Namyong Park**, Nesreen Ahmed, and Danai Koutra.

[3] **Forward Learning of Graph Neural Networks**.
International Conference on Learning Representations (ICLR), 2024.
Namyong Park, Xing Wang, Antoine Simoulin, Shuai Yang, Grey Yang, Ryan Rossi, Puja Trivedi, and Nesreen Ahmed.

[4] **Fairness-Aware Graph Neural Networks: A Survey**.
ACM Transactions on Knowledge Discovery from Data (TKDD), 2024.
April Chen, Ryan Rossi, **Namyong Park**, Puja Trivedi, Yu Wang, Tong Yu, Sungchul Kim, Franck Dernoncourt, and Nesreen Ahmed.

[5] **GLEMOS: Benchmark for Instantaneous Graph Learning Model Selection**.
Neural Information Processing Systems (NeurIPS), 2023.
Namyong Park, Ryan Rossi, Xing Wang, Antoine Simoulin, Nesreen Ahmed, and Christos Faloutsos.

[6] **CallMine: Fraud Detection and Visualization of Million-Scale Call Graphs**.
ACM International Conference on Information and Knowledge Management (CIKM), 2023.
Mirela T. Cazzolato, Saranya Vijayakumar, Meng-Chieh Lee, Catalina Vajiac, **Namyong Park**, Pedro Fidalgo, Agma J. M. Traina, and Christos Faloutsos.

[7] **Memory-Efficient Selective Fine-Tuning**.
ES-FoMo (Efficient Systems for Foundation Models) Workshop at ICML, 2023.
Antoine Simoulin, **Namyong Park**, Xiaoyi Liu, and Grey Yang.
Best Paper Award.

[8] **MetaGL: Evaluation-Free Selection of Graph Learning Models via Meta-Learning**.
International Conference on Learning Representations (ICLR), 2023.
Namyong Park, Ryan Rossi, Nesreen Ahmed, and Christos Faloutsos.

[9] **On Graph Time-Series Representations for Temporal Networks**.
The ACM Web Conference (TheWebConf), 2023.
Ryan Rossi, Nesreen Ahmed, and **Namyong Park**.

[10] **TgrApp: Anomaly Detection and Visualization of Large-Scale Call Graphs**.
AAAI Conference on Artificial Intelligence (AAAI), 2023.
Mirela T. Cazzolato, Saranya Vijayakumar, Xinyi Zheng, **Namyong Park**, Meng-Chieh Lee, Duen Horng Chau, Pedro Fidalgo, Bruno Lages, Agma J. M. Traina, and Christos Faloutsos.

[11] **DeltaShield: Information Theory for Human-Trafficking Detection**.
ACM Transactions on Knowledge Discovery from Data (TKDD), 17(2), 2023.
Catalina Vajiac, Meng-Chieh Lee, Aayushi Kulshrestha, Sacha Levy, **Namyong Park**, Andreas M. Olligschlaeger, Cara Jones, Reihaneh Rabbany, and Christos Faloutsos.

[12] **TgraphSpot: Fast and Effective Anomaly Detection for Time-Evolving Graphs**.
IEEE International Conference on Big Data (IEEE BigData), 2022.
Mirela T. Cazzolato, Saranya Vijayakumar, Xinyi Zheng, **Namyong Park**, Meng-Chieh Lee, Pedro Fidalgo, Bruno Lages, Agma J. M. Traina, and Christos Faloutsos.

[13] **CGC: Contrastive Graph Clustering for Community Detection and Tracking**.
The ACM Web Conference (TheWebConf), 2022.
Namyong Park, Ryan Rossi, Eunyee Koh, Iftikhar Ahamath Burhanuddin, Sungchul Kim, Fan Du, Nesreen Ahmed, and Christos Faloutsos.

[14] **VisPaD: Visualization and Pattern Discovery for Fighting Human Trafficking**.
The ACM Web Conference (TheWebConf), 2022.
Pratheeksha Nair, Yifei Li, Catalina Vajiac, Andreas M. Olligschlaeger, Meng-Chieh Lee, **Namyong Park**, Duen Horng Chau, Christos Faloutsos, and Reihaneh Rabbany.

[15] **TrafficVis: Visualizing Organized Activity and Spatio-Temporal Patterns for Detecting and Labeling Human Trafficking**.
IEEE Visualization Conference (VIS), 2022.
Catalina Vajiac, Duen Horng Chau, Andreas M. Olligschlaeger, Rebecca Mackenzie, Pratheeksha Nair, Meng-Chieh Lee, Yifei Li, **Namyong Park**, Reihaneh Rabbany, and Christos Faloutsos.
Best Paper Honorable Mention Award.

[16] **EvoKG: Jointly Modeling Event Time and Network Structure for Reasoning over Temporal Knowledge Graphs**.
ACM International Conference on Web Search and Data Mining (WSDM), 2022.
Namyong Park, Fuchen Liu, Purvanshi Mehta, Dana Cristofor, Christos Faloutsos, and Yuxiao Dong.

[17] **Knowledge-Guided Dynamic Systems Modeling: A Case Study on Modeling River Water Quality**.
arXiv, abs/2103.00792, 2021.
Namyong Park, Minhyeok Kim, Nguyen Xuan Hoai, Robert I. McKay, and Dong-Kyun Kim.

[18] **TrafficVis: Fighting Human Trafficking through Visualization**.
IEEE Visualization Conference (VIS), 2021.
Catalina Vajiac, Andreas M. Olligschlaeger, Yifei Li, Pratheeksha Nair, Meng-Chieh Lee, **Namyong Park**, Reihaneh Rabbany, Duen Horng Chau, and Christos Faloutsos.
Best Poster Honorable Mention Award.

[19] **Knowledge-Based Dynamic Systems Modeling: A Case Study on Modeling River Water Quality**.
IEEE International Conference on Data Engineering (ICDE), 2021.
Namyong Park, Minhyeok Kim, Nguyen Xuan Hoai, Robert I. McKay, and Dong-Kyun Kim.

[20] **InfoShield: Generalizable Information-Theoretic Human-Trafficking Detection**.

IEEE International Conference on Data Engineering (ICDE), 2021.
Meng-Chieh Lee*, Catalina Vajiac*, Aayushi Kulshrestha, Sacha Levy, **Namyong Park**, Cara Jones, Reihaneh Rabbany, and Christos Faloutsos.

[21] **J-Recs: Principled and Scalable Recommendation Justification**.
IEEE International Conference on Data Mining (ICDM), 2020.
Namyong Park, Andrey Kan, Christos Faloutsos, and Xin Luna Dong.

[22] **MultiImport: Inferring Node Importance in a Knowledge Graph from Multiple Input Signals**.
ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD), 2020.
Namyong Park, Andrey Kan, Xin Luna Dong, Tong Zhao, and Christos Faloutsos.

[23] **PACC: Large scale connected component computation on Hadoop and Spark**.
PLOS ONE, 15(3):1–25, 2020.
Ha-Myung Park, **Namyong Park**, Sung-Hyon Myaeng, and U Kang.

[24] **Dropout Prediction over Weeks in MOOCs by Learning Representations of Clicks and Videos**.
AI4EDU (Artificial Intelligence for Education) Workshop at AAAI, 2020.
Byungsoo Jeon* and **Namyong Park***.

[25] **Dropout Prediction over Weeks in MOOCs via Interpretable Multi-Layer Representation Learning**.
AI4EDU (Artificial Intelligence for Education) Workshop at AAAI, 2020.
Byungsoo Jeon*, **Namyong Park***, and Seojin Bang*.

[26] **Estimating Node Importance in Knowledge Graphs Using Graph Neural Networks**.
ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD), 2019.
Namyong Park, Andrey Kan, Xin Luna Dong, Tong Zhao, and Christos Faloutsos.

[27] **Fast and scalable method for distributed Boolean tensor factorization**.
The *VLDB* Journal, 28(4):549–574, 2019.
Namyong Park, Sejoon Oh, and U Kang.

[28] **High-Performance Tucker Factorization on Heterogeneous Platforms**.
IEEE Transactions on Parallel and Distributed Systems (TPDS), 30(10):2237–2248, 2019.
Sejoon Oh, **Namyong Park**, Jun-Gi Jang, Lee Sael, and U Kang.

[29] **Acute kidney injury predicts all-cause mortality in patients with cancer**.
Cancer Medicine, 8(6):2740–2750, 2019.
Eunjeong Kang, Minsu Park, Peong Gang Park, **Namyong Park**, Younglee Jung, U Kang, Hee Gyung Kang, Dong Ki Kim, Kook-Hwan Oh, Kwon Wook Joo, Yon Su Kim, Hyung Jin Yoon, and Hajeong Lee.

[30] **Predicting acute kidney injury in cancer patients using heterogeneous and irregular data**.
PLOS ONE, 13(7):1–21, 2018.
Namyong Park, Eunjeong Kang, Minsu Park, Hajeong Lee, Hee-Gyung Kang, Hyung-Jin Yoon, and U. Kang.

[31] **Scalable Tucker Factorization for Sparse Tensors - Algorithms and Discoveries**.
IEEE International Conference on Data Engineering (ICDE), 2018.
Sejoon Oh, **Namyong Park**, Lee Sael, and U Kang.
Samsung Humantech Paper Award—Gold Prize (1st in Computer Science).

[32] **Fast and Scalable Distributed Boolean Tensor Factorization**.
IEEE International Conference on Data Engineering (ICDE), 2017.
Namyong Park, Sejoon Oh, and U Kang.

[33] **BePI: Fast and Memory-Efficient Method for Billion-Scale Random Walk with Restart**.
ACM International Conference on Management of Data (SIGMOD), 2017.
Jinhong Jung, **Namyong Park**, Lee Sael, and U Kang.

[34] **BIGtensor: Mining Billion-Scale Tensor Made Easy**.
ACM International Conference on Information and Knowledge Management (CIKM), 2016.
Namyong Park*, Byungsoo Jeon*, Jungwoo Lee, and U Kang.

[35] **Partition Aware Connected Component Computation in Distributed Systems**.
IEEE International Conference on Data Mining (ICDM), 2016.
Ha-Myung Park, **Namyong Park**, Sung-Hyon Myaeng, and U Kang.

[36] **A Distributed Vertex Rearrangement Algorithm for Compressing and Mining Big Graphs**.
Journal of KIISE, 43(10):1131–1143, 2016.
Namyong Park, Chiwan Park, and U Kang.

[37] **Improvement of complex and refractory ecological models: Riverine water quality modelling using evolutionary computation**.
Ecological Modelling, 291:205–217, 2014.
MinHyeok Kim, **Namyong Park**, RI Bob McKay, Haisoo Shin, Yun-Geun Lee, Kwang-Seuk Jeong, and Dong-Kyun Kim.

[38] **Cutting Evaluation Costs: An Investigation into Early Termination in Genetic Programming**.
IEEE Congress on Evolutionary Computation (CEC), 2013.
Namyong Park, Kangil Kim, and Robert I. McKay.

[39] **Evolving the Best Known Approximation to the Q Function**.
Genetic and Evolutionary Computation Conference (GECCO), 2012.
Dao Ngoc Phong, Nguyen Xuan Hoai, Robert Ian McKay, Constantin Siriteanu, Nguyen Quang Uy, and **Namyong Park**.

Awards, Honors and Grants

Best Paper Award, ES-FoMo (Efficient Systems for Foundation Models) Workshop at ICML 2023	Jul 2023
Best Paper Honorable Mention Award, IEEE VIS 2022	Oct 2022
Bloomberg Data Science Ph.D. Fellowship, Bloomberg	Aug 2021–Aug 2022
AWS Cloud Credits for Research, Amazon	Aug 2021–Aug 2022
Best Poster Honorable Mention Award, IEEE VIS 2021	Oct 2021
ILJU Foundation Ph.D. Fellowship, ILJU Academy and Culture Foundation	Aug 2017–Jul 2021
Microsoft Research Collaboration Grant, Microsoft	Oct 2020–May 2021
The 2020 PITA Program Grant, Pennsylvania Infrastructure Technology Alliance	Jan 2020–May 2021
Samsung Humantech Paper Award, Samsung	Feb 2018

- Gold Prize—1st in Computer Science

Software Maestro Program Winner, Ministry of Knowledge Economy of Korea	Oct 2011
Software Service New Business Idea Award, Ministry of Knowledge Economy of Korea	Sep 2011
summa cum laude **Graduation Honors**, Seoul National University	Aug 2010

Previous Research and Work Experience

Adobe Research	San Jose, CA
Research Intern (Mentor: Dr. Ryan Rossi / Manager: Dr. Eunyee Koh)	May 2021–Aug 2021

- Developed a contrastive graph clustering framework for community detection and tracking

Microsoft Research	Redmond, WA
Research Intern (Mentor: Dr. Yuxiao Dong)	Jun 2020–Aug 2020

- Developed a dynamic graph neural network model and designed a phishing detection method for large communication data

Amazon	Seattle, WA
Applied Scientist Intern (Mentor: Dr. Andrey Kan / Manager: Dr. Xin Luna Dong)	May 2019–Aug 2019

- Developed a method to integrate multiple observed signals to learn universal node importance in a knowledge graph

Amazon   Seattle, WA
Applied Scientist Intern (Mentor: Dr. Andrey Kan / Manager: Dr. Xin Luna Dong)   May 2018–Aug 2018
- Developed a graph neural network model for estimating node importance in knowledge graphs

Carnegie Mellon University   Pittsburgh, PA
Research Assistant (Advisor: Prof. Christos Faloutsos)   Sep 2017–Sep 2022
- Developed effective and scalable approaches for the modeling, analysis, and representation learning of various types of complex data such as graphs, time series, tensors, and text for applications like question answering, recommendation, knowledge reasoning and discovery, explanation, and anomaly detection

Seoul National University   Seoul, Korea
Research Staff, Data Mining Lab (Advisor: Prof. U Kang)   Sep 2015–Jul 2017
- Developed fast and scalable algorithms for tensors and graphs, including distributed CP and Tucker factorization methods for tensor analysis, and large-scale graph algorithms for connected component computation and random walk with restart

SAP Labs Korea   Seoul, Korea
Software Developer   Jan 2015–Jan 2016
- Improved performance of the row-store component of SAP HANA in-memory database, and enhanced monotoring capabilities

Fancy   New York, NY (remote)
Software Engineer   Aug 2013–Dec 2014
- Developed backend systems and dashboards for handling purchase orders, inventories, order shipping, and warehousing fee.

Seoul National University   Seoul, Korea
Research Assistant, Structural Complexity Lab (Advisor: Prof. Robert Ian McKay)   Feb 2011–May 2013
- Devised an early termination technique that improves the learning efficiency of genetic programming systems
- Designed a model that performs an incremental dynamic simulation of the water flow and algal growth in a river system

Software Maestro Program   Seoul, Korea
Software Developer   Aug 2010–Oct 2011
- Developed a platform and a mobile application that provide personalized search and recommendations for restaurants, and a location-based mobile service for buying and selling items

Naver   Seongnam, Korea
Software Engineer   Feb 2006–Aug 2008
- Developed and improved Naver web services, including Naver Knowledge Search (the largest collaborative knowledge-sharing service in Korea), Naver Book (a book search and preview service) and Naver Academic (a search service for academic materials)

Teaching Experience

Carnegie Mellon University
Teaching Assistant
- 10-707 Topics in Deep Learning (Instructor: Prof. Ruslan Salakhutdinov)   Jan 2019–May 2019
- 15-351/15-650/02-613 Algorithms and Advanced Data Structures (Instructor: Prof. Jian Ma)   Aug 2018–Dec 2018

Seoul National University
Teaching Assistant
- CSE 4190.101 Discrete Mathematics (Instructor: Prof. Robert Ian McKay)   Mar 2012–Jun 2012

Professional Services

Journal Reviewer
- ACM Transactions on Knowledge Discovery from Data (TKDD)   2024
- IEEE Transactions on Knowledge and Data Engineering (TKDE)   2023
- Data Mining and Knowledge Discovery (DMKD)   2023, 2022
- IEEE Transactions on Dependable and Secure Computing (TDSC)   2022
- Knowledge and Information Systems (KAIS)   2020
- The International Journal on Very Large Data Bases (VLDB)   2020, 2018

Program Committee Member and Reviewer for Conferences and Workshops

- ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)   2023, 2022, 2019, 2017
- Neural Information Processing Systems (NeurIPS) (Datasets and Benchmarks Track)   2024, 2023
- The ACM Web Conference (TheWebConf) (Social Network Analysis and Graph Algorithms Track)   2023
- ACM International Conference on Web Search and Data Mining (WSDM)   2024
- New Frontiers in Graph Learning (GLFrontiers) Workshop at NeurIPS   2022
- ACM International Conference on Information and Knowledge Management (CIKM)   2022, 2016
- AAAI Conference on Artificial Intelligence (AAAI)   2021
- European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML PKDD) (Applied Data Science Track)   2020
- ACM SIGAPP Symposium on Applied Computing (SAC)   2017
- IEEE International Conference on Data Science and Advanced Analytics (DSAA)   2016
- Interactive Data Exploration and Analytics (IDEA) Workshop at KDD   2016