

JINSEONG PARK

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SUMMARY

Affiliation Ph.D. Candidate at Statistical Learning and Computational Finance Laboratory, Department of Industrial Engineering, Seoul National University, Republic of Korea

Research Topics Modeling SAFE AI with High Generalization Performance

EDUCATION

Mar 2022 - present Seoul National University
Ph.D. Candidate in Industrial Engineering (Supervisor: Jaewook Lee)

Mar 2020 - Feb 2022 Seoul National University
Master of Science (MS) degree in Industrial Engineering
- Thesis: Differentially private multi-class classification using kernel supports and equilibrium points (Supervisor: Jaewook Lee)
- Cumulative Major GPA: 4.19/4.30

Mar 2019 - Aug 2019 Technische Universität Graz in Austria (Student exchange programme)
Bachelor's programme in Mechanical Engineering

Mar 2016 - Feb 2020 Pohang University of Science and Technology (POSTECH)
Bachelor of Science (BS) degree in Industrial and Management Engineering
- Graduated with Honors: Summa Cum Laude (rank: 1/22)
- Cumulative GPA: 3.91/4.30, Major GPA: 4.03/4.30

FIELD OF INTEREST

Data Privacy in AI

- Developing training algorithms mitigating the inevitable performance degradation caused by differential privacy to protect training data.
- Analyzing the learning dynamics of private deep learning optimization and reducing data access in machine learning models.

Model Security in AI

- Developing defense methods against adversarial attacks by identifying smooth loss landscapes of nearby data examples in various domains.

Generalization in AI

- Investigating geometric properties of loss landscapes and Hessian matrices in deep learning optimization.
- Analyzing learning dynamics of deep learning to identify well-generalizing flat minima.

Reliable Forecasting AI

- Designing robust and explainable time series models to address inconsistencies in the output of AI forecasting in finance and manufacturing.

PUBLICATIONS

† indicates equal contribution.

- [1] **Jinseong Park**[†], Yujin[†] Choi, Jaewook Lee, “In-distribution Public Data Synthesis with Diffusion Models for Differentially Private Image Classification”. In: *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition* (2024).
- [2] Yujin Choi[†], **Jinseong Park**[†], Hoki Kim, Jaewook Lee, Saerom Park, “Fair Sampling in Diffusion Models through Switching Mechanism”. In: *Proceedings of the AAAI Conference on Artificial Intelligence* (2024).
- [3] Hoki Kim, **Jinseong Park**, Yujin Choi, Jaewook Lee, “Fantastic Robustness Measures: The Secrets of Robust Generalization”. In: *Advances in Neural Information Processing Systems* (2023).
- [4] **Jinseong Park**, Hoki Kim, Yujin Choi, Jaewook Lee, “Differentially Private Sharpness-Aware Training”. In: *International Conference on Machine Learning* (2023).
- [5] Sungyoon Lee, **Jinseong Park**, Jaewook Lee, “Implicit Jacobian regularization weighted with impurity of probability output”. In: *International Conference on Machine Learning* (2023).
- [6] **Jinseong Park**, Hoki Kim, Yujin Choi, Woojin Lee, Jaewook Lee, “Fast sharpness-aware training for periodic time series classification and forecasting”. In: *Applied Soft Computing* (2023), p. 110467.
- [7] Hoki Kim, **Jinseong Park**, Jaewook Lee, “Generating Transferable Adversarial Examples for Speech Classification”. In: *Pattern Recognition* 137 (2023), p. 109286.
- [8] **Jinseong Park**, Yujin Choi, Junyoung Byun, Jaewook Lee, Saerom Park, “Efficient differentially private kernel support vector classifier for multi-class classification”. In: *Information Sciences* 619 (2023), pp. 889–907.
- [9] Yujin Choi, **Jinseong Park**, Jaewook Lee, Hoki Kim, “Exploring Diverse Feature Extractions for Adversarial Audio Detection”. In: *IEEE Access* 11 (2023), pp. 2351–2360.
- [10] Sungyoon Lee, Woojin Lee, **Jinseong Park**, Jaewook Lee, “Towards Better Understanding of Training Certifiably Robust Models against Adversarial Examples”. In: *Advances in Neural Information Processing Systems* 34 (2021), pp. 953–964.

WORK IN PROGRESS (PREPRINT)

- [1] **Jinseong Park**, Hyungjin Ko, Jaewook Lee, “Exploring Generative AI for Modeling the Dynamics of Asset Price Process”. In: *Available at SSRN 4491342* (2023).
- [2] Hoki Kim, **Jinseong Park**, Yujin Choi, Jaewook Lee, “Stability Analysis of Sharpness-Aware Minimization”. In: *arXiv preprint arXiv:2301.06308* (2023).
- [3] Hoki Kim, **Jinseong Park**, Yujin Choi, Woojin Lee, Jaewook Lee, “Exploring the Effect of Multi-step Ascent in Sharpness-Aware Minimization”. In: *arXiv preprint arXiv:2302.10181* (2023).
- [4] Private Under-reviews.

PRESENTATIONS

Conference/Workshop

- Wine recommendation System using BERT, Spring Conference of Korean Institute of Industrial Engineers (KIIE), Jun 2021.
- Enhancing non-linear asset volatility forecasting models with investor sentiment and explainable AI, Korea Computer Congress (KCC) 2023 XAI workshop, Best paper awards (2/37), Jun 2023.

WORK EXPERIENCE

R&D Digital Transformation Team Intern, SK Telecom, Seoul, Korea Jun 2018 - Aug 2018

- Developed services for R&D Digital Transformation of internal data clusters
- Classified and organized technology reports

LNG industry research project with POSCO Energy, Pohang, Korea 2018

- Organized value chains of the LNG industry
- Concluded LNG strategic implications of POSCO Energy

TEACHING ASSISTANT EXPERIENCE

Teaching Assistant (TA) for Prof. Jaewook Lee, Seoul National University 2020 - present

- Undergraduate courses: Statistics for Industrial Engineering (Spring 2020, Spring 2022, and Spring 2023), Mathematical Methods for Industrial and Management Engineering (Fall 2020)
- Graduate courses: Data Mining Technology (Fall 2022), Advanced Topics in Statistical Learning (Spring 2023)

Education Programs 2020 - present

- Instructor for Big data analysis with Python and deep learning with PyTorch in Woori Bank (2022)
- Instructor for AI practice course in Korea Institute of Startup & Entrepreneurship Development (KISED) (2022)
- TA for Machine Learning and Deep Learning for Prof. Jaewook Lee in SNU Big-Data FinTech course (2021 and 2023)
- TA for Python programming for Prof. Namhyung Kim in SNU Big-Data FinTech course (2022)
- TA for Optimization and Linear Algebra for Prof. Jaewook Lee in Samsung Data Scientist for Device Solution (2020-2022)
- TA for Optimization and Linear Algebra for Prof. Jaewook Lee in Industrial Bank of Korea (2020 and 2021)

COURSES

Algorithmic Fairness Summer school at UCLA Jul 2023

- Participate in Graduate Summer School 2022 of Institute for Pure & Applied Mathematics (IPAM) at University of California, Los Angeles (UCLA)
- This course was organized by Cynthia Dwork, Guy Rothblum, and Noa Dagan

SCHOLARSHIP

2022 - 2023	Teaching Assistance scholarship, Seoul National University, Full tuition for all semesters.
2021 Fall	Scholarship for Academic Excellence, Seoul National University, Merit-based, 30% of tuition for a semester.
2019 Spring	Scholarship for Exchange Students, POSTECH.
2018 Fall, 2019 Fall	Mentor Scholarship for IME Information System Tech, C++ programming, POSTECH.
2018 - 2019	National Scholarship for Science and Engineering, Republic of Korea, Merit-based, full tuition for all semesters.
2016 - 2017	Scholarship for Academic Excellence, POSTECH, Merit-based, full tuition for all semesters.

SKILLS

Programming	Python (PyTorch for AI), C++, C, LaTeX
Leadership	Manager of Association of POSTECH Grown Companies (APGC)-Lab, (2018-2019) POSTECH Start-up Incubator Member and Honorary Member of POSTECH Broadcasting System (PBS) (2016-2018)
Language	Korean (Native), English (Advanced)