Dr. Gyunam Park



Biography_

Gyunam Park is a **data scientist who conducts research in process mining**. At the intersection of process science and data science, Park designs/develops a wide range of techniques/methods to extract actionable insights to improve the performance of business processes. His research spans a variety of topics, including object-centric process mining, predictive process monitoring, resource allocation, and optimization.

Park is deeply passionate about **applying his research to real-world challenges**. He has successfully led industry projects across multiple sectors, such as semiconductor and steel manufacturing, retail, and healthcare. Additionally, he has contributed to the development of open-source software tools, making his research outputs accessible to the broader public.

Park earned his **Ph.D. in computer science from RWTH Aachen University**, under the supervision of Prof. Dr. Wil van der Aalst. His doctoral thesis, focused on action-oriented process mining, explores how insights from process mining techniques can be translated into actionable management decisions. He holds an M.Sc. in Industrial and Management Engineering from Pohang University of Science and Technology (POSTECH), Korea, and a B.Sc. in Technology Management and Computer Science from Ulsan National Institute of Science and Technology (UNIST), Korea.

Professional Experience

Fraunhofer Institute for Applied Information Technology

Group Lead

- Lead a process mining group of five researchers and software developers within the Data Science and Artificial Intelligence department.
- Oversee the acquisition and management of industry projects.
- Coordinate the Center for Process Intelligence (CPI), driving interdisciplinary research and project initiatives across Fraunhofer FIT.

RWTH Aachen Univ.

Lecturer/Instructor

- Oversaw 30+ software tool development projects in software labs, enhancing computer science students' practical skills. Led to a web application demonstration at a prestigious conference with 200+ attendees.
- Lectured in Introduction to Data Science (800 students) and Business Process Intelligence (450 students). Improved course content and teaching methods, elevating students' evaluation scores from 2.5 to 1.5 (1.0 being the highest) and enhancing success rates for big data topics (Hadoop and MapReduce) from 30% to 90%.

Process and Data Science Group

Researcher

- Headed a team in AIStudyBuddy project with €3.9 million budget, benefiting more than 100,000 students across major German universities. Managed interdisciplinary collaborations between 8 research groups.
- Co-founded the first Object-Centric Process Mining (OCPM) Python library, OCPA, achieving over 5,000 clones; this work led to the adoption of developed techniques by leading process mining software vendors including Celonis and IBM.
- Led research in Action-Oriented Process Mining (AOPM) and guided industry projects in retail, manufacturing, and real estate.

Analytics and Information Management Lab @ POSTECH

Researcher

FEBRUARY 20, 2025

- Collaborated with Samsung Electronics to develop an AI-based algorithm for optimal equipment path recommendation in semiconductor manufacturing. Contributed to achieving over 95% yield rate in semiconductor manufacturing.
- Developed software for a process performance prediction using Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs); the software was adopted by a steel manufacturing company and a tertiary hospital in S.Korea.

Oct. 2019 - Sep. 2024 practical skills. Led

Aachen, Germany Oct. 2019 - Sep. 2024

Sankt Augustin, Germany Sep. 2024 - Present

> Aachen, Germany Oct. 2019 - Sep. 2024

Pohang, S.Korea Jun. 2017 - Sep. 2019

Education

RWTH-Aachen University

Ph.D. in Computer Science

- Thesis: Action-oriented Process Mining
- Supervisor: Prof. Wil van der Aalst

Pohang University of Science and Technology (POSTECH)

M.Sc. in Industrial and Management Engineering

• Thesis: Predicting performances in business processes using deep neural networks

• Supervisor: Prof. Minseok Song

Ulsan National Institute of Science & Technology (UNIST)

B.Sc. in Technology Management & Computer Science

• Summa Cum Laude

Teaching Experience ____

COURSES TAUGHT

- Lecturer, Process Discovery Using Python, Graduate Lab Course, RWTH-Aachen University, 2022 present
- Lecturer, Introduction to Process Discovery Using Python, Undergraduate Lab Course, RWTH-Aachen University, 2022 present
- Instructor, Introduction to Data Science, Graduate Course, RWTH-Aachen University, 2019 2022
- Instructor, Selected Topics in Process Mining, Graduate Course, RWTH-Aachen University, 2021
- Instructor, Business Process Intelligence, Undergraduate Course, RWTH-Aachen University, 2020
- Tutor, Al and IoT Technology Training Program, POSTECH, 2018
- Tutor, POSCO AI-Expert Training Program, POSCO, 2018
- Teaching Assistant, Introduction to Optimization, Undergraduate Course, POSTECH, 2018
- Teaching Assistant, Database System, Undergraduate Course, POSTECH, 2017

GRADUATE STUDENTS ADVISED

- Jennifer He, Computer Science, RWTH-Aachen University, 04.2024 08.2024 Thesis: Recommending Heuristic Functions for Efficient Alignment Computation
- Jan Brinkmann, Computer Science, RWTH-Aachen University, 07.2023 02.2024 Thesis: A Novel Approach to Graph Embedding for Process Executions
- Linus Detro, Computer Science, RWTH-Aachen University, 05.2023 10.2023 Thesis: Graph Querying for Object-Centric Event Logs
- Emilie Hastrup-Kiil, Computer Science, RWTH-Aachen University, 02.2023 06.2023 Thesis: Object-Centric Super Variants
- Antonio Sheqi, Computer Science, RWTH-Aachen University, 08.2022 02.2023 Thesis: Configuration-Aware Counterfacutal Analysis in business processes
- Janik-Vasily Benzin, Computer Science, RWTH-Aachen University, 03.2020 03.2021 Thesis: Context-aware detection of deviations in process executions

UNDERGRADUATE STUDENTS ADVISED

- Kacper Kuca, Computer Science, RWTH-Aachen University, 07.2024 11.2024
 Thesis: A Customizable Framework for Explainable Recommendations Using Reference Groups
- Julian Kofferath, Computer Science, RWTH-Aachen University, 03.2020 03.2021 Thesis: Applying Object-Centric Process Mining to a Real Business Process: Inventory in SAP ERP Systems
- Aaron Kusters, Computer Science, RWTH-Aachen University, 03.2020 03.2021
 Thesis: Object-Centric Process Mining on Event Data Extracted from SAP ERP Systems

Research Projects

FEBRUARY 20, 2025

Aachen, Germany Oct. 2019 - July. 2024

Pohang, S.Korea Sep.2017 - Aug. 2019

Ulsan, S.Korea Mar. 2011 - Aug. 2017

- Process Modeling Using LLMs, 2024 2025 Funded by *Fraunhofer ZV* (€30,000)
- AlStudyBuddy, 2023 2024
 Funded by German Federal Ministry of Education and Research and VDI/VDE-IT (€3,900,000)
- Process Mining over SAP Data (PM-SAP), 2020 2024 Funded by *Alexander von Humboldt Foundation*

Industry Projects _____

- Root cause analysis of bottlenecks in FAB, 2019 2020 Funded by *Samsung Electronics*
- Development of algorithm for recommending best resource path using AI, 2018 Funded by *Samsung Electronics*
- Development of best reference resource mining algorithm, 2017 Funded by *Samsung Electronics*

Software Projects_____

- OCPA: Object-Centric Process Analysis Documentation: https://ocpa.readthedocs.io/; Source Code: https://github.com/ocpm/ocpa;
- ProAct: Action-Oriented Process Mining Documentation: https://proact.readthedocs.io/; Source Code: https://github.com/gyunamister/proact;

Publications_

JOURNAL ARTICLES

- **16.** Park, Gyunam, Lukas Liss, and Wil M. P. van der Aalst. Learning recommendations from educational event data in higher education. *Journal of Intelligent Information Systems*, Aug 2024
- **15. Gyunam Park** and Wil M.P. van der Aalst. Operational process monitoring: An object-centric approach. *Computers in Industry*, 164:104170, 2025
- 14. Gyunam Park, Yaejin Lee, and Minsu Cho. Enhancing healthcare process analysis through object-centric process mining: Transforming omop common data models into object-centric event logs. *Journal of Biomedical Informatics*, page 104682, 2024
- **13.** Hyomin Kim, **Gyunam Park**, and Minsu Cho. Unlocking learner engagement and performance: A multidimensional approach to mapping learners to learning cohorts. *Education and Information Technologies*, pages 1–41, 2024
- 12. Gyunam Park, Daniel Schuster, and Wil M. P. van der Aalst. Pattern-based action engine: Generating process management actions using temporal patterns of process-centric problems. *Comput. Ind.*, 153:104020, 2023
- 11. Gyunam Park, Minsu Cho, and Jiyoon Lee. Leveraging machine learning for automatic topic discovery and forecasting of process mining research: A literature review. *Expert Systems with Applications*, 239:122435, 2024
- 10. Jan Niklas Adams, **Gyunam Park**, and Wil M. P. van der Aalst. Preserving complex object-centric graph structures to improve machine learning tasks in process mining. *Eng. Appl. Artif. Intell.*, 125:106764, 2023
- 9. Alessandro Berti, **Gyunam Park**, Majid Rafiei, and Wil M. P. van der Aalst. A generic approach to extract object-centric event data from databases supporting SAP ERP. *J. Intell. Inf. Syst.*, 61(3):835–857, 2023
- 8. Alessandro Berti, Urszula Jessen, **Gyunam Park**, Majid Rafiei, and Wil M. P. van der Aalst. Analyzing interconnected processes: using object-centric process mining to analyze procurement processes. *International Journal of Data Science and Analytics*, 2023
- 7. Gyunam Park and Minseok Song. Optimizing resource allocation based on predictive process monitoring. *IEEE Access*, 11:38309–38323, 2023

- Mohammadreza Fani Sani, Mozhgan Vazifehdoostirani, Gyunam Park, Marco Pegoraro, Sebastiaan J. van Zelst, and Wil M. P. van der Aalst. Performance-preserving event log sampling for predictive monitoring. *J. Intell. Inf. Syst.*, 61(1):53–82, 2023
- 5. Jan Niklas Adams, Gyunam Park, and Wil M. P. van der Aalst. ocpa: A python library for object-centric process analysis. *Softw. Impacts*, 14:100438, 2022
- 4. Gyunam Park and Wil M. P. van der Aalst. Action-oriented process mining: bridging the gap between insights and actions. *Progress in Artificial Intelligence*, 2022
- 3. Minsu Cho, Gyunam Park, Minseok Song, Jinyoun Lee, and Euiseok Kum. Quality-aware resource model discovery. *Applied Sciences*, 11(12), 2021
- Minsu Cho, Park, Gyunam, Minseok Song, Jinyoun Lee, Byeongeon Lee, and Euiseok Kum. Discovery of resource-oriented transition systems for yield enhancement in semiconductor manufacturing. *IEEE Transactions on Semiconductor Manufacturing*, 34(1):17–24, 2021
- 1. Gyunam Park and Minseok Song. Predicting performances in business processes using deep neural networks. *Decis. Support Syst.*, 129, 2020

REFEREED CONFERENCE PROCEEDINGS

- 12. Jan Niklas Adams, Emilie Hastrup-Kiil, Gyunam Park, and Wil M. P. van der Aalst. Super variants. In Andrea Marrella, Manuel Resinas, Mieke Jans, and Michael Rosemann, editors, *Business Process Management 22nd International Conference, BPM 2024, Krakow, Poland, September 1-6, 2024, Proceedings*, volume 14940 of *Lecture Notes in Computer Science*, pages 111–128. Springer, 2024
- 11. Gyunam Park, Jan Niklas Adams, and Wil M. P. van der Aalst. Conformance checking and performance analysis using object-centric directly-follows graphs. In Andrea Marrella, Manuel Resinas, Mieke Jans, and Michael Rosemann, editors, *Business Process Management Forum*, pages 179–196, Cham, 2024. Springer Nature Switzerland
- **10.** Jan Niklas Adams, **Gyunam Park**, and Wil M. P. van der Aalst. Improving predictive process monitoring using objectcentric process mining. In *The 32nd European Conference on Information Systems, ECIS 2024, Paphos, Cyprus, 13-19 June, 2024, Proceedings,* 2024
- 9. Gyunam Park, Majid Rafiei, Hayyan Helal, Gerhard Lakemeyer, and Wil M. P. van der Aalst. Incorporating behavioral recommendations mined from event logs into AI planning. In Shareeful Islam and Arnon Sturm, editors, *Intelligent Information Systems CAISE Forum 2024, Limassol, Cyprus, June 3-7, 2024, Proceedings*, volume 520 of *Lecture Notes in Business Information Processing*, pages 20–28. Springer, 2024
- Jan Niklas Adams, Gyunam Park, Sergej Levich, Daniel Schuster, and Wil M. P. van der Aalst. A framework for extracting and encoding features from object-centric event data. In Javier Troya, Brahim Medjahed, Mario Piattini, Lina Yao, Pablo Fernández, and Antonio Ruiz-Cortés, editors, Service-Oriented Computing - 20th International Conference, ICSOC 2022, Seville, Spain, November 29 - December 2, 2022, Proceedings, volume 13740 of Lecture Notes in Computer Science, pages 36–53. Springer, 2022
- 7. Gyunam Park, Janik-Vasily Benzin, and Wil M. P. van der Aalst. Detecting context-aware deviations in process executions. In Claudio Di Ciccio, Remco M. Dijkman, Adela del-Río-Ortega, and Stefanie Rinderle-Ma, editors, Business Process Management BPM 2022, Münster, Germany, September 11-16, 2022, Proceedings, volume 458 of Lecture Notes in Business Information Processing, pages 190–206. Springer, 2022
- 6. Gyunam Park, Jan Niklas Adams, and Wil M. P. van der Aalst. Opera: Object-centric performance analysis. In Jolita Ralyté, Sharma Chakravarthy, Mukesh K. Mohania, Manfred A. Jeusfeld, and Kamalakar Karlapalem, editors, *Conceptual Modeling* - 41st International Conference, ER 2022, Hyderabad, India, October 17-20, 2022, Proceedings, volume 13607 of Lecture Notes in Computer Science, pages 281–292. Springer, 2022
- 5. Gyunam Park, Marco Comuzzi, and Wil M. P. van der Aalst. Analyzing process-aware information system updates using digital twins of organizations. In Renata S. S. Guizzardi, Jolita Ralyté, and Xavier Franch, editors, *Research Challenges in*

Information Science - 16th International Conference, RCIS 2022, Barcelona, Spain, May 17-20, 2022, Proceedings, volume 446 of Lecture Notes in Business Information Processing, pages 159–176. Springer, 2022

- 4. Gyunam Park and Wil M. P. van der Aalst. Realizing A digital twin of an organization using action-oriented process mining. In Claudio Di Ciccio, Chiara Di Francescomarino, and Pnina Soffer, editors, *3rd International Conference on Process Mining, ICPM 2021, Eindhoven, The Netherlands, October 31 - Nov. 4, 2021*, pages 104–111. IEEE, 2021
- 3. Anahita Farhang Ghahfarokhi, Gyunam Park, Alessandro Berti, and Wil M. P. van der Aalst. OCEL: A standard for object-centric event logs. In Ladjel Bellatreche, Marlon Dumas, Panagiotis Karras, Raimundas Matulevicius, Ahmed Awad, Matthias Weidlich, Mirjana Ivanovic, and Olaf Hartig, editors, New Trends in Database and Information Systems ADBIS 2021 Short Papers, Doctoral Consortium and Workshops: DOING, SIMPDA, MADEISD, MegaData, CAONS, Tartu, Estonia, August 24-26, 2021, Proceedings, volume 1450 of Communications in Computer and Information Science, pages 169–175. Springer, 2021
- 2. Gyunam Park and Wil M. P. van der Aalst. Towards reliable business process simulation: A framework to integrate ERP systems. In Adriano Augusto, Asif Gill, Selmin Nurcan, Iris Reinhartz-Berger, Rainer Schmidt, and Jelena Zdravkovic, editors, *Enterprise, Business-Process and Information Systems Modeling 22nd International Conference, BPMDS 2021, and 26th International Conference, EMMSAD 2021, Held at CAiSE 2021, Melbourne, VIC, Australia, June 28-29, 2021, Proceedings*, volume 421 of Lecture Notes in Business Information Processing, pages 112–127. Springer, 2021
- Gyunam Park and Minseok Song. Prediction-based resource allocation using LSTM and minimum cost and maximum flow algorithm. In *International Conference on Process Mining, ICPM 2019, Aachen, Germany, June 24-26, 2019*, pages 121–128. IEEE, 2019

REFEREED WORKSHOP/DEMO PROCEEDINGS

- 12. Dina Kretzschmann, **Gyunam Park**, Alessandro Berti, and Wil M. P. van der Aalst. Overstock problems in a purchase-to-pay process: An object-centric process mining case study. In João Paulo A. Almeida, Claudio Di Ciccio, and Christos Kalloniatis, editors, *Advanced Information Systems Engineering Workshops CAiSE 2024 International Workshops, Limassol, Cyprus, June 3-7, 2024, Proceedings*, volume 521 of *Lecture Notes in Business Information Processing*, pages 347–359. Springer, 2024
- 11. Gyunam Park, Sevde Aydin, Cüneyt Ugur, and Wil M. P. van der Aalst. Analyzing an after-sales service process using objectcentric process mining: A case study. In Johannes De Smedt and Pnina Soffer, editors, *Process Mining Workshops - ICPM 2023 International Workshops, Rome, Italy, October 23-27, 2023, Revised Selected Papers*, volume 503 of *Lecture Notes in Business Information Processing*, pages 406–418. Springer, 2023
- 10. Tian Li, Gyunam Park, and Wil M. P. van der Aalst. Checking constraints for object-centric process executions. In Johannes De Smedt and Pnina Soffer, editors, Process Mining Workshops ICPM 2023 International Workshops, Rome, Italy, October 23-27, 2023, Revised Selected Papers, volume 503 of Lecture Notes in Business Information Processing, pages 392–405. Springer, 2023
- 9. Majid Rafiei, Duygu Bayrak, Mahsa Pourbafrani, Gyunam Park, Hayyan Helal, Gerhard Lakemeyer, and Wil M. P. van der Aalst. Extracting rules from event data for study planning. In Johannes De Smedt and Pnina Soffer, editors, *Process Mining Workshops - ICPM 2023 International Workshops, Rome, Italy, October 23-27, 2023, Revised Selected Papers*, volume 503 of *Lecture Notes in Business Information Processing*, pages 361–374. Springer, 2023
- 8. Gyunam Park and Wil M. P. van der Aalst. Monitoring constraints in business processes using object-centric constraint graphs. In Marco Montali, Arik Senderovich, and Matthias Weidlich, editors, *Process Mining Workshops ICPM 2022 International Workshops, Bozen-Bolzano, Italy, October 23-28, 2022, Revised Selected Papers*, volume 468 of *Lecture Notes in Business Information Processing*, pages 479–492. Springer, 2022
- 7. Gyunam Park, Aaron Küsters, Mara Tews, Cameron Pitsch, Jonathan Schneider, and Wil M. P. van der Aalst. Explainable predictive decision mining for operational support. In Javier Troya, Raffaela Mirandola, Elena Navarro, Andrea Delgado, Sergio Segura, Guadalupe Ortiz, Cesare Pautasso, Christian Zirpins, Pablo Fernández, and Antonio Ruiz-Cortés, editors, Service-Oriented Computing ICSOC 2022 Workshops ASOCA, AI-PA, FMCIoT, WESOACS 2022, Sevilla, Spain, November 29 December 2, 2022 Proceedings, volume 13821 of Lecture Notes in Computer Science, pages 66–79. Springer, 2022
- 6. Julian Weber, Gyunam Park, Majid Rafiei, and Wil M. P. van der Aalst. Interactive process identification and selection from SAP ERP (extended abstract). In Marwan Hassani, Agnes Koschmider, Marco Comuzzi, Fabrizio Maria Maggi, and

Luise Pufahl, editors, *Proceedings of the ICPM Doctoral Consortium and Demo Track 2022 co-located with 4th International Conference on Process Mining (ICPM 2022), Bolzano, Italy, October, 2022*, volume 3299 of *CEUR Workshop Proceedings*, pages 61–64. CEUR-WS.org, 2022

- 5. Alessandro Berti, Anahita Farhang Ghahfarokhi, **Gyunam Park**, and Wil M. P. van der Aalst. A scalable database for the storage of object-centric event logs. *CoRR*, abs/2202.05639, 2022
- 4. Alessandro Berti, Gyunam Park, Majid Rafiei, and Wil M. P. van der Aalst. An event data extraction approach from SAP ERP for process mining. In Jorge Munoz-Gama and Xixi Lu, editors, *Process Mining Workshops ICPM 2021 International Workshops, Eindhoven, The Netherlands, October 31 November 4, 2021, Revised Selected Papers*, volume 433 of *Lecture Notes in Business Information Processing*, pages 255–267. Springer, 2021
- Mohammadreza Fani Sani, Mozhgan Vazifehdoostirani, Gyunam Park, Marco Pegoraro, Sebastiaan J. van Zelst, and Wil M. P. van der Aalst. Event log sampling for predictive monitoring. In Jorge Munoz-Gama and Xixi Lu, editors, Process Mining Workshops - ICPM 2021 International Workshops, Eindhoven, The Netherlands, October 31 - November 4, 2021, Revised Selected Papers, volume 433 of Lecture Notes in Business Information Processing, pages 154–166. Springer, 2021
- Gyunam Park and Wil M. P. van der Aalst. A general framework for action-oriented process mining. In Adela del-Río-Ortega, Henrik Leopold, and Flávia Maria Santoro, editors, *Business Process Management Workshops - BPM 2020 International Work-shops, Seville, Spain, September 13-18, 2020, Revised Selected Papers*, volume 397 of *Lecture Notes in Business Information Processing*, pages 206–218. Springer, 2020
- Sven Weinzierl, Sandra Zilker, Matthias Stierle, Martin Matzner, and Gyunam Park. From predictive to prescriptive process monitoring: Recommending the next best actions instead of calculating the next most likely events. In Norbert Gronau, Moreen Heine, Hanna Krasnova, and K. Poustcchi, editors, *Entwicklungen, Chancen und Herausforderungen der Digitalisierung: Proceedings der 15. Internationalen Tagung Wirtschaftsinformatik, WI 2020, Potsdam, Germany, March 9-11, 2020. Zentrale Tracks*, pages 364–368. GITO Verlag, 2020

PRESENTATIONS

- 2. Gyunam Park, Minsu Cho, Minseok Song, and Jinyeon Lee. A methodology for analyzing inefficiencies in semiconductor logistics based on logistics data warehouse. pages 1718–1740. Industrial Engineering and Management Science, April 2019
- 1. Gyunam Park, Minsu Cho, Minseok Song, and Jinyeon Lee. Development on optimal resource path mining in semiconductor industry. pages 1380–1393. Industrial Engineering and Management Science, April 2018

Honors & Awards

2023	Best Paper Award, Education meets Process Mining Workshop	Italy
2022	Best Paper Award, Process Querying, Manipulation, and Intelligence Workshop	Italy
2011 - 201	78 Consecutive Scholarships, Academic Performance Scholarship	S.Korea
2015 - 2016 Scholarship , Samsung Dream Class Scholarships		S. Korea
2013	3rd-prize Award, UNIST Global Startup Competition	S. Korea

Professional Activities

Reviewer of Scientific Journals

- Information Systems, Elsevier (SJR Q1)
- IEEE Transactions on Services Computing, IEEE (SJR Q1)
- Computing, Springer (SJR Q1)
- Knowledge-Based Systems, Springer (SJR Q1)
- Business & Information Systems Engineering, Springer (SJR Q1)
- Knowledge and Information Systems, Springer (SJR Q1)

Computing Languages _____

Python Frameworks: Flask, FastAPI; Libraries: Pandas, NumPy, scikit-learn, PyTorch

Java Spring Framework, Hibernate

Web JavaScript, TypeScript, React, Angular, Bootstrap, d3.js

Querying SQL, Cypher

Mark-up HTML, CSS, &TEX, XML

Languages_____

KoreanMother tongueEnglishProficientGermanConversational