

# Gyunam Park

Scientific Assistant, Chair of Process and Data Science, RWTH-Aachen University

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## 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 previous and ongoing research topics include action-oriented process mining, object-centric process mining, predictive business process monitoring, context-aware deviation detection, resource allocation optimization, etc.

Park received his B.S. in Technology Management and Computer Science from Ulsan National Institute of Science & Technology (UNIST), Ulsan, Korea in 2017 and his M.S. in Industrial and Management Engineering from Pohang University of Science and Technology (POSTECH), Pohang, Korea in 2019. During his B.S./M.S. studies and industrial projects, he developed his interests in the field of process mining. He started his Ph.D. study in the Process and Data Science team in RWTH Aachen University, led by Prof.Dr. Wil M.P. van der Aalst, the founder of process mining.

## Education

### RWTH-Aachen University

Ph.D. in Computer Science

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

Aachen, Germany

Expected Dec. 2023

### 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*

Pohang, S.Korea

Aug. 2019

### Ulsan National Institute of Science & Technology (UNIST)

B.Sc. in Technology Management & Computer Science

- Summa Cum Laude

Ulsan, S.Korea

Aug. 2017

## Professional Experience

### Chair of Process and Data Science (PADS) @ RWTH Aachen Univ.

Scientific Assistant

Aachen, Germany

Oct. 2019 - Present

### Analytics and Information Management Lab @ POSTECH

Research Assistant

Pohang, S.Korea

Jun. 2017 - Sep. 2019

## Professional Activities

### • Reviewer of Scientific Journals

- Information Systems, Elsevier (SJR Q1)
- IEEE Transactions on Services Computing, IEEE (SJR Q1)

## Publications

### JOURNAL ARTICLES

7. **Gyunam Park** and Minseok Song. Optimizing resource allocation based on predictive process monitoring. *IEEE Access*, 2023. Accepted
6. Mohammadreza Fani Sani, Mozghan Vazifehdoostirani, **Gyunam Park**, Marco Pegoraro, Sebastiaan J. van Zelst, and Wil M. P. van der Aalst. Performance-preserving event log sampling for predictive monitoring. *Journal of Intelligent Information Systems*, pages 1–30, 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
3. Minsu Cho, **Gyunam Park**, Minseok Song, Jinyoun Lee, and Euseok Kum. Quality-aware resource model discovery. *Applied Sciences*, 11(12), 2021
2. Minsu Cho, **Park, Gyunam**, Minseok Song, Jinyoun Lee, Byeongeon Lee, and Euseok 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

8. 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 Forum - BPM 2022 Forum, 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
1. **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

8. **Gyunam Park** and Wil M. P. van der Aalst. Monitoring constraints in business processes using object-centric constraint graphs. *CoRR*, abs/2210.12080, 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, Raffaella 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
3. 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
2. **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 Workshops, Seville, Spain, September 13-18, 2020, Revised Selected Papers*, volume 397 of *Lecture Notes in Business Information Processing*, pages 206–218. Springer, 2020
1. 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

## Teaching Experience

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### COURSES TAUGHT

- Instructor, **Process Discovery Using Python**, Graduate Lab Course, RWTH-Aachen University, 2022 - present
- Instructor, **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, **AI 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

- Antonio Sheqi, Computer Science, RWTH-Aachen University, 08.2022 - 02.2023  
Thesis: Configuration-Aware Counterfactual 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

- 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

## Industry Projects

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

## Honors & Awards

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|-------------|---|-----------------|
| 2022        | <b>Best Paper Award</b> , Process Querying, Manipulation, and Intelligence Workshop | <i>Italy</i>    |
| 2011 - 2017 | <b>8 Consecutive Scholarships</b> , Academic Performance Scholarship                | <i>S.Korea</i>  |
| 2015 - 2016 | <b>Scholarship</b> , Samsung Dream Class Scholarships                               | <i>S. Korea</i> |
| 2013        | <b>3rd-prize Award</b> , UNIST Global Startup Competition                           | <i>S. Korea</i> |

## Languages

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- Korean** Mother tongue  
**English** Proficient  
**German** Intermediate

## Computing Languages

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- Stand-alone** Python, Java, C/C++, Bash  
**Web** JavaScript, Typescript  
**Querying** SQL, Cypher  
**Mark-up**  $\LaTeX$ , XML, HTML, CSS