Dongyeon Kim

Ph.D. Candidate • Computer Science and Artificial Intelligence
Dongguk University | Seoul, South Korea
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Research Interests

Multi-label learning, weakly supervised learning, and distance metric learning, with an interest in data-driven approaches to real-world problem solving.

Education

Ph.D. in Computer Science and Artificial Intelligence Sep. 2023 – Present
Dongguk University, Seoul, South Korea
Advisor: Prof. Gangman Yi | Expected graduation: Aug. 2027

M.S. in Multimedia Engineering Sep. 2021 – Aug. 2023
Dongguk University, Seoul, South Korea
Advisor: Prof. Gangman Yi
Thesis: A Study on Parameter Automation Algorithm for Clustering-based Multi-metric Learning

B.S. in Multimedia Engineering Mar. 2016 – Aug. 2021
Dongguk University, Seoul, South Korea
Graduated with Highest Honors

Research Experience

Graduate Researcher, DataLab, Dongguk University Sep. 2021 – Present

- Develop multi-label learning algorithms for classifying data instances associated with multiple labels.
- Design classification algorithms for real-world data with incomplete or ambiguous supervision, including multi-instance multi-label learning (MIML), partial multi-label learning (PML), and multi-labeled complementary label learning (MLCLL).
- Design distance metric learning methods to capture task-relevant similarities and support classification and clustering.
- Develop optimization methods and algorithms for data-driven solutions to real-world problems.

Publications

Journal Articles

1. Seungmin Lee, Yejin Kan, **Dongyeon Kim**, Minseop Kim, and Gangman Yi. "A Method for Consensus Anchor Graph Learning for Incomplete Multi-View Clustering." *IEEE Access*, 14:18155–18168, 2026. doi:10.1109/ACCESS.2026.3659917.
2. Yejin Kan, **Dongyeon Kim**, Jinkyung Yang, and Gangman Yi. "GapSense: Similarity Estimation-Based Gap Filler with TGS-Reads for Genome Assemblies." *Interdisciplinary Sciences: Computational Life Sciences*, 18(2):501–514, 2026. doi:10.1007/s12539-025-00770-y.
3. Mingeun Ji, Yejin Kan, **Dongyeon Kim**, Seungmin Lee, and Gangman Yi. "DeepPI: Alignment-Free Analysis of Flexible Length Proteins Based on Deep Learning and Image Generator." *Interdisciplinary Sciences: Computational Life Sciences*, 16(3):1–12, 2024. doi:10.1007/s12539-024-00618-x.
4. Adil Abdu Bushra, **Dongyeon Kim**, Yejin Kan, and Gangman Yi. "AutoSCAN: Automatic Detection of DBSCAN Parameters and Efficient Clustering of Data in Overlapping Density Regions." *PeerJ Computer Science*, 10:e1921, 2024. doi:10.7717/peerj-cs.1921.

5. **Dongyeon Kim**, Yejin Kan, Seungmin Lee, and Gangman Yi. "Parameter-Free Basis Allocation for Efficient Multiple Metric Learning." *Machine Learning: Science and Technology*, 4(4):045049, 2023. doi:10.1088/2632-2153/ad113b.
6. **Dongyeon Kim**, Yejin Kan, YooJin Aum, Wanhee Lee, and Gangman Yi. "Hotspots-Based Patrol Route Optimization Algorithm for Smart Policing." *Heliyon*, 9(10):e20931, 2023. doi:10.1016/j.heliyon.2023.e20931.
7. Mingeun Ji, Yejin Kan, **Dongyeon Kim**, Jaehee Jung, and Gangman Yi. "cPlot: Contig-Plotting Visualization for the Analysis of Short-Read Nucleotide Sequence Alignments." *International Journal of Molecular Sciences*, 23(19):11484, 2022. doi:10.3390/ijms231911484.

Conference Papers

1. **Dongyeon Kim**, Yejin Kan, and Gangman Yi. "T-MDML: Triplet-Based Multiple Distance Metric Learning for Multi-Instance Multi-Label Classification with Label Correlation." *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI)*, 39(17):17850–17858, 2025. doi:10.1609/aaai.v39i17.33963.
2. Yejin Kan, **Dongyeon Kim**, and Gangman Yi. "A Novel Gap-Filling Method Based on Hybrid Read Information Analysis." *IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, pp. 3827–3829, 2022. doi:10.1109/BIBM55620.2022.9994889.
3. **Dongyeon Kim**, Yejin Kan, and Gangman Yi. "Novel Patrol Route Optimization Method Based on Big Data Analysis." *IEEE International Conference on Big Data (IEEE BigData)*, pp. 6699–6701, 2022. doi:10.1109/BigData55660.2022.10020159.

Manuscripts Under Review

1. **Dongyeon Kim** and Gangman Yi. "Partial Multi-Label Learning: A Comprehensive Survey of Learning Strategies, Extensions, Evaluation Practices, and Future Directions." Under review.
2. **Dongyeon Kim** and Gangman Yi. "Pseudo-label Correlation-aware Contrastive Learning for Multi-Labeled Complementary Label Learning." Under review.
3. Jaehoon Jung, **Dongyeon Kim**, Eunseo Kim, Sejin Park, Gangman Yi, Wanhee Lee, and Sangjin Park. "From Crime Analysis to Operational Policing: Real-World Validation of Hotspot-Based Patrol Route Optimisation." Under review.
4. **Dongyeon Kim**, Yejin Kan, Minseop Kim, and Gangman Yi. "Crime-Risk-Based Patrol Route Optimization for Crime Prevention in Urban Road Networks." In revision.
5. **Dongyeon Kim** and Gangman Yi. "Label-Specific Disambiguation via Distance Metric Learning for Partial Multi-Label Classification." In revision.

Conference Presentations and Contributions

1. **Dongyeon Kim**. "T-MDML: Triplet-Based Multiple Distance Metric Learning for Multi-Instance Multi-Label Classification with Label Correlation." Top Conference Session, *Korea Software Congress (KSC 2025)*, Dec. 2025. Received a Certificate of Appreciation.
2. Ilkhomjon Sadriddinov, Yejin Kan, **Dongyeon Kim**, Jinkyung Yang, and Gangman Yi. "Novel Algorithm for Finding Maximum k-Balanced Biclique Based on Formal Concept Analysis." *15th International Conference on Frontier Computing (FC)*, 2025.

Conference Papers (Korea)

1. Minseop Kim, Yejin Kan, **Dongyeon Kim**, Ilkhomjon Sadriddinov, and Gangman Yi. "HS Code Classification Using Graph RAG with an HS Explanatory Notes-Based Knowledge Graph." *Proceedings of the Korea Computer Congress (KCC)*, pp. 324–326, 2026. DBpia. (in Korean)
2. Yerin Lee, **Dongyeon Kim**, Yejin Kan, Seungmin Lee, and Gangman Yi. "Public Data-Based Hotspot Detection and Patrol Route Optimization with Spatiotemporal Data." *Proceedings of the Korea Computer Congress (KCC)*, pp. 414–416, 2024. DBpia. (in Korean)
3. Yejin Kan, **Dongyeon Kim**, Mingeun Ji, Seungmin Lee, and Gangman Yi. "BLAST-Based Gap Analysis for Gap Filling Algorithm." *Proceedings of the Korea Computer Congress (KCC)*, pp. 1625–1627, 2022. DBpia.

(in Korean)

Teaching Experience

Teaching Assistant, Dongguk University 2021–2022; 2024–2026

- **Spring 2026:** Algorithms.
- **Fall 2025:** Algorithms; Database Design.
- **Spring 2025:** Data Structures; Database Systems.
- **Fall 2024:** Database Design.
- **Spring 2024:** Introduction to Programming; Database Systems; Data Structures.
- **Spring 2022:** Database Systems; Data Structures.
- **Fall 2021:** Introduction to Programming; Computer Networks.

Honors

- **Outstanding Next-Generation Engineering Researcher Award**, IPESK, South Korea (Oct. 2025).

Scholarships

- **Dongguk Global Fellowship**, Dongguk University (Fall 2023–Spring 2025; four semesters).
- **Dongguk University Alumni Scholarship**, Dongguk University (Fall 2023).
- **B&M (Bachelor's–Master's) Scholarship**, Dongguk University (Spring 2022; Fall 2022).
- **Dongguk Future Leaders Scholarship**, Dongguk University (Fall 2021).

Patent

Dongyeon Kim, Gangman Yi, Yejin Kan, Yujin Eom, and Wanhee Lee.
"Hotspots-based patrol route optimization algorithm for smart policing."
Republic of Korea Patent No. 10-2751950. Granted Jan. 3, 2025; filed Dec. 14, 2023.

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