Myounghwan Lee

Department of Mathematics, Hanyang University sycuel@hanyang.ac.kr

Research Interests

Algorithmic graph theory, Structural graph theory, Parameterized Complexity

Keywords: Width / depth parameters, Erdős-Pósa property

Current Position

Ph.D. (Student) **Hanyang University**, Mathematics — Sept. 2023 – Present

Education

M.S. **Hanyang University**, Mathematics — Mar. 2022 – Aug. 2023
Advisor: O-joung Kwon
Thesis title: α-edge-crossing width and its applications

Incheon National University, Mathematics — Sept. 2021 - Feb. 2022
Advisor: O-joung Kwon

B.S. **Incheon National University**, Mathematics — Mar. 2017 – Aug. 2021

Journal Papers

1. Pre-assignment problem for unique minimum vertex cover on bounded clique-width graphs
(with Shinwoo An, Yeonsu Chang, Kyungjin Cho, O-joung Kwon, Eunjin Oh, and Hyeonjun Shin)
Theoretical Computer Science,Volume 1084,2026,116173
AAAI 2025 accepted, arXiv:2408.09591
2. A new width parameter of graphs based on edge cuts: α-edge-crossing width
(with Yeonsu Chang, and O-joung Kwon)
Discrete Applied Mathematics, Volume 380, 2026, Pages 492-510
WG 2023 accepted, arXiv:2302.04624
3. A characterization of graphs of radius-r flip-width at most 2
(with Yeonsu Chang, Sejin Ko, and O-joung Kwon)
Discrete Mathematics 348(4) (Apr, 2025), 114366, arXiv:2306.15206
4. Graphs without two vertex-disjoint S-cycles
(with Minjeong Kang, and O-joung Kwon)
Discrete Mathematics. 343(10) (Oct 2020) 111997, arXiv:1908.09065

Refereed Conference Papers without Journal version

1. An FPT algorithm for cycle rank on semi-complete digraphs
(with Seokbeom Kim, and O-joung Kwon)
ISAAC 2026 accepted, arXiv:2606.29336

Submitted Papers

1. An efficient algorithm for $\mathcal{F}$-subgraph-free Edge Deletion on graphs having a product structure
(with Shinwoo An, Seonghyuk Im, and Seokbeom Kim)
arXiv:2510.14674
2. Unavoidable butterfly minors in digraphs of large cycle rank
(with Meike Hatzel, O-joung Kwon, and Sebastian Wiederrecht)
arXiv:2507.11814

Presentations

1. Graph Theory and Research Stories (그래프 이론과 연구 이야기)
   HYU MATH Symposium 2026
   September 30, 2026, Hanyang University, Korea
2. Cycle rank: a depth parameter on digraphs
   Workshop for Young Mathematicians in Korea (WYMK 2026)
   August 19-21, 2026, KAIST, Daejeon
3. Graph modification problems on sparse graph classes and more
   Korean Student Combinatorics Workshop 2026 Winter
   February 2-6, 2026, Yeosu, Korea
4. Unavoidable butterfly minors in digraphs of large cycle rank
   2025 Combinatorics Workshop
   August 18-20, 2025, Institute for Basic Science (IBS), Daejeon, Korea
5. Obstructions for depth parameters: Tree-depth and cycle-rank
   Math Colloquium at Hanyang University
   April 8, 2025, Hanyang University, Korea
6. Unavoidable butterfly minors in digraphs of large cycle rank
   2024 KMS Annual Meeting
   October 24-26, 2024, Sungkyunkwan University, Suwon, Korea
7. A new width parameter of graphs based on edge cuts: α-edge-crossing width
   2024 SIAM Discrete Math Conference
   July 8-11, 2024, Spokane, Washington, USA
8. A new width parameter of graphs based on edge cuts: α-edge-crossing width
   49th International Workshop on Graph-Theoretic Concepts in Computer Science (WG2023)
   June 28-30, 2023, University of Fribourg, Switzerland
9. Graphs without two vertex-disjoint S-cycles
   Colourings, Independence and Domination 18th WORKSHOP ON GRAPH THEORY (CID 2019)
   September 15-20, 2019, Piechowice, Poland
10. Graphs without two disjoint S-cycles (with Minjeong Kang)
    Combinatorics workshop 2019
    August 13-15, 2019, Songdo, Incheon, Korea

Teaching Assistant

1. **Modern Algebra 1**, Spring 2026, Hanyang University
2. **Algorithm Design and Analysis**, Fall 2025, Hanyang University
3. **Combinatorial Mathematics**, Spring 2025, Hanyang University
4. **Modern Algebra 1**, Spring 2025, Hanyang University
5. **Modern Algebra 2**, Fall 2024, Hanyang University
6. **Graph Theory**, Spring 2024, Hanyang University
7. **Modern Algebra 2**, Fall 2023, Hanyang University
8. **Modern Algebra 1**, Spring 2023, Hanyang University
9. **Number Theory**, Spring 2022, Hanyang University
10. **Combinatorics and Graph Theory**, Spring 2021, Incheon National University
11. **Introduction to Optimization**, Fall 2020, Incheon National University
12. **Combinatorics and Graph Theory**, Spring 2020, Incheon National University