

CURRICULUM VITAE

Basic Information

Name in full : Minho Song

Office : 51352D, Sungkyunkwan University, Suwon, South Korea

Research Area : algebraic combinatorics, combinatorial matrix theory

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Positions

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| September 2023 – Present | Post-doctoral fellow, Sungkyunkwan University. |
| May 2019 – August 2023 | Post-doctoral fellow, AORC, Sungkyunkwan University. |
| May 2018 – April 2019 | BK Post-doctoral fellow, Sungkyunkwan University. |
| March 2018 – April 2018 | Post-doctoral fellow, Sungkyunkwan University. |

Education

March 2012 – February 2018 Ph.D. in Mathematics, Sungkyunkwan University.

Advisor: Prof. Gi-Sang Cheon

Thesis : “Riordan Lie Algebra and Extended Riordan groups”

March 2010 – February 2012 M.S. in Mathematics, Sungkyunkwan University.

Advisor: Prof. Gi-Sang Cheon

Thesis : “Geometric Progression Matrices and Generalizations”

March 2006 – February 2010 B.S. in Mathematics, Sungkyunkwan University.

Research Interests

My research lies in enumerative combinatorics, with particular emphasis on Riordan group theory, symmetric functions, and the combinatorial structures arising in the theory of (generalized) orthogonal polynomials.

Research Activities

Preprints

- *Combinatorics of generalized orthogonal polynomials of type R_{II}* (with Jang Soo Kim), arXiv:2411.12345.
- *Combinatorics of orthogonal polynomials on the unit circle* (with Jihyeug Jang), arXiv:2407.07508.

Published/Accepted Papers

- *Refined canonical stable Grothendieck polynomials and their duals, Part 2* (with Byung-Hak Hwang, Jihyeug Jang, Jang Soo Kim, and U-Keun Song), European Journal of Combinatorics, 127 (2025), 104166.
- *Combinatorial reciprocity for Riordan arrays* (with Jihyeug Jang and Louis W. Shapiro), Linear Algebra and its Applications, in press, available online 5 February 2025.
- *Kemeny's constant and enumerating Braess edges in trees* (with Jihyeug Jang, Mark Kempton, Sooyeong Kim, Adam Knudson, and Neal Madras), Linear & Multilinear Algebra (2024), 1–37.
- *Refined canonical stable Grothendieck polynomials and their duals, Part 1* (with Byung-Hak Hwang, Jihyeug Jang, Jang Soo Kim, and U-Keun Song), Advances in Mathematics, 446 (2024), 109670.
- *A Riordan group poset* (with Louis W. Shapiro), Linear Algebra and its Applications, 689 (2024), 66–85.
- *Strictly monotone sequences of lower and upper bounds on Perron values and their combinatorial applications* (with Sooyeong Kim), Linear & Multilinear Algebra (2024), 1–29.
- *Kemeny's constant and Wiener index on trees* (with Jihyeug Jang and Sooyeong Kim), Linear Algebra and its Applications, 674 (2023), 230–243.
- *Negative moments of orthogonal polynomials* (with Jihyeug Jang, Donghyun Kim, Jang Soo Kim, and U-Keun Song), Forum of Mathematics, Sigma 11 (2023), Paper No. e22, 34 pp.
- *Enumeration of bipartite non-crossing geometric graphs* (with G.-S Cheon, H. Choi, G. Esteban), Discrete Applied Mathematics, 317(2022), 86–100.
- *A new aspect of Riordan arrays via Krylov matrices* (with G.-S Cheon), Linear Algebra and its Applications, 554 (2018), 329–341.
- *Finite and infinite dimensional Lie group structures on Riordan groups* (with G.-S. Cheon, A. Luzon, M. A. Moron, L. F. Prieto-Martinez), Advances in Mathematics, 319 (2017), 522–566.

Workshops Attended

- *Mathematical Modeling in Industry XIX*, University of Minnesota, August 5-14, 2015.

Conference Talks

- *Combinatorics of generalized orthogonal polynomials of type R_{II}* , 2025 KMS Spring Meeting, KAIST, South Korea.
- *Combinatorics of the orthogonal polynomials on the unit circle (OPUC)*, 2024 Combinatorics Workshop, August 28–30, 2024, Chungbuk National University, South Korea.
- *About Riordan group posets*, The 9th International Symposium on Riordan Arrays and Related Topics (9RART), June 3–5, 2024, Howard University, USA.
- *Combinatorial reciprocity for Riordan arrays*, The 30th KIAS Combinatorics Workshop, March 8–9, 2024, KIAS, South Korea.

- *Combinatorics on the negative part of Riordan matrices*, The 25th Conference of the International Linear Algebra Society, June 12–16, 2023, Madrid, Spain.
- *Enumerative results for connected bipartite non-crossing geometric graphs*, The 24th Conference of the International Linear Algebra Society, June 20–24, 2022, Ireland.
- *Enumeration of connected bipartite non-crossing geometric graphs*, 2021 KMS Spring Meeting, April 29–30, 2021, South Korea (Online).
- *Riordan group theory and connected bipartite non-crossing graphs*, 2020 Gyeonggi-Incheon Combinatorics Workshop, November 27, 2020, South Korea (Online).
- *A relation between strongly connected tournaments and connected graphs*, The 6th International Workshop on Riordan Arrays and Related Topics, July 1–5, 2019, TSIMF, Sanya, China.
- *A proof of an open problem on the commutator subgroup of the Riordan group*, Joint Mathematics Meetings, January 16–19, 2019, Baltimore, USA.
- *A new aspect of the Riordan group via Krylov matrices*, The 3rd International Symposium on Riordan Arrays and Related Topics, June 20–23, 2016, Illinois Wesleyan University, USA.
- *Lie Theory in the Riordan group*, East Asian Core Doctorial Forum on Mathematics, January 18–21, 2015, National Taiwan University, Taiwan.
- *Krylov matrices versus orthogonal polynomials*, The Second International Symposium on Riordan Arrays and Related Topics, July 14–16, 2015, Campus Lecco, Politecnico di Milano, Italy.
- *The Riordan Lie algebra*, 2014 KMS Annual Meeting, October 24–25, 2014, Yonsei University, South Korea.
- *On the commutator subgroup of the Riordan group*, The 19th Conference International Linear Algebra Society, August 6–9, 2014, Sungkyunkwan University, South Korea.
- *The Riordan Lie group and the corresponding Lie algebra*, 2014 Kangwon-Kyungki Mathematical Society Meeting, June 20, 2014, Incheon National University, South Korea.
- *Geometric progression matrices and an application to the orthogonal polynomials*, 2014 AKOOS-PNU International Conference, February 5–7, 2014, Pusan National University, South Korea.

Academic Event Organization

- Co-Organizer, *Intensive Workshop on Algebraic Combinatorics*, Department of Mathematics, Sungkyunkwan University, January 14–18, 2025.
- Co-Organizer, *Intensive Workshop on Enumerative Combinatorics*, Department of Mathematics, Sungkyunkwan University, January 24–28, 2022.

Honors and Awards

- *Sejong Science Fellowship* from National Research Foundation of Korea, March 2022 – February 2027.
- *Creativity Challenge Research* from National Research Foundation of Korea, June 2019 – May 2022.
- *Doctoral Dissertation Award* from Korean Mathematical Society, April 21, 2018.
- *2014 AKOOS-PNU International Conference Best Presentation Award* from Pusan National University, February 7, 2014.
- *BK21 Scholarship Program for graduate students* from National Research Foundation of Korea, March 2010 – February 2016.
- *Global Ph.D Fellowship* from National Research Foundation of Korea, March 2010 – February 2013.

Date: May 5, 2025