# CURRICULUM VITAE

## Basic Information

Name in full : Minho Song
Office : 51352D, Sungkyunkwan University, Suwon, South Korea
Research Area : algebraic combinatorics, combinatorial matrix theory

Email: smh3227@skku.edu

## Positions

| | |
|---|---|
| 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 (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.

- *Refined canonical stable Grothendieck polynomials and their duals, Part 2* (with Byung-Hak Hwang, Jihyeug Jang, Jang Soo Kim, and U-Keun Song), arXiv:2404.02483.

## Published/Accepted Papers

○ *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), arXiv:2309.02977

○ *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 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, China.

- *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.


## Honors and Awards

- *Sejong Science Fellowship* from National Research Foundation of Korea, March 2022 – February 2025.

- *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: April 21, 2025