

Sungmin Kim, Ph.D. Candidate

✉ rena_rio@yonsei.ac.kr

🌐 <https://renariodyne.github.io/>

Research interests:

- String, subsequence, and pattern matching algorithms
- Pattern matching under various equivalence relations
- Simon's congruence

Education

- 2022 – Present 📖 **Ph.D. candidate in Computer Science, Yonsei University**
- 2017 – 2022 📖 **B.A. in English Language and Literature, Yonsei University**
- 📖 **B.E. in Computer Science, Yonsei University**
Double major, Highest honors at graduation.

Research Publications

Journal Articles




- 1 **S. Kim**, Y.-S. Han, S.-K. Ko, and K. Salomaa, "On the Simon's congruence neighborhood of languages," under review.
- 2 Y.-S. Han, **S. Kim**, S.-K. Ko, and K. Salomaa, "Existential and universal width of alternating finite automata," *Information and Computation*, p. 105 337, 2025.
- 3 **S. Kim** and Y.-S. Han, "Approximate Cartesian tree pattern matching," *Theoretical Computer Science*, p. 115 506, 2025.
- 4 **S. Kim**, S.-K. Ko, and Y.-S. Han, "Simon's congruence pattern matching," *Theoretical Computer Science*, vol. 994, p. 114 478, 2024.
- 5 **S. Kim**, Y.-S. Han, S.-K. Ko, and K. Salomaa, "On Simon's congruence closure of a string," *Theoretical Computer Science*, vol. 972, p. 114 078, 2023.

Conference Proceedings

- 1 **S. Kim** and Y.-S. Han, "Pattern mining under Simon's congruence," in *Proceedings of the 29th International Conference on Developments in Language Theory (DLT)*, vol. 16036, Springer, 2025, pp. 182–196.
- 2 **S. Kim** and Y.-S. Han, "Approximate Cartesian tree pattern matching," in *Proceedings of the 28th International Conference on Developments in Language Theory (DLT)*, vol. 14791, Springer, 2024, pp. 189–202.
- 3 P. Fleischmann, **S. Kim**, T. Koß, *et al.*, "Matching patterns with variables under Simon's congruence," in *Proceedings of the 17th International Conference on Reachability Problems (RP)*, vol. 14235, 2023, pp. 155–170.
- 4 Y.-S. Han, **S. Kim**, S.-K. Ko, and K. Salomaa, "Existential and universal width of alternating finite automata," in *Proceedings of the 25th International Conference on Descriptive Complexity of Formal Systems (DCFS)*, vol. 13918, 2023, pp. 51–64.
- 5 **S. Kim**, Y.-S. Han, S.-K. Ko, and K. Salomaa, "On the Simon's congruence neighborhood of languages," in *Proceedings of the 27th International Conference on Developments in Language Theory (DLT)*, vol. 13911, 2023, pp. 168–181.



- 6 **S. Kim**, Y.-S. Han, S.-K. Ko, and K. Salomaa, “On Simon’s congruence closure of a string,” in *Proceedings of the 24th International Conference on Descriptive Complexity of Formal Systems (DCFS)*, vol. 13439, 2022, pp. 127–141.
- 7 **S. Kim**, S.-K. Ko, and Y.-S. Han, “Simon’s congruence pattern matching,” in *Proceedings of the 33rd International Symposium on Algorithms and Computation (ISAAC)*, vol. 248, 2022, 60:1–60:17.

Experience



- Summer 2023  Visiting research at Göttingen University, Germany
- Summer 2022  Visiting research at Queen’s University, Canada
- 2023 – 2025  Teaching Assistant: Data Structures / Automata and Formal Languages / Theory of Computation / Analysis of Algorithms

Miscellaneous

Language Skills

- Korean  native speaker
- English  fluent

Graduate Scholarships

- 2022 – 2024  Accelerated degree program scholarship
- 2023  Academic research support ARF fellowship grant