# Sungmin Kim, Ph.D. Candidate

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Research interests:

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

## Education

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|---|---|
| 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**<br>Double major, Highest honors at graduation. |

## Research Publications

### Journal Articles

1. Y.-S. Han, **S. Kim**, S.-K. Ko, and K. Salomaa, "Existential and universal width of alternating finite automata," under review.

2. **S. Kim** and Y.-S. Han, "Approximate Cartesian tree pattern matching," *Theoretical Computer Science*, 2025, to appear.

3. **S. Kim**, Y.-S. Han, S.-K. Ko, and K. Salomaa, "On the Simon's congruence neighborhood of languages," under review.

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)*, 2025, to appear.

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 Descriptional 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 Descriptional 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, 2024 | ▉ | Teaching Assistant: Data Structures / Automata and Formal Languages / Theory of Computation |

## Miscellaneous

### Language Skills

| Korean | ▉ | native speaker |
| English | ▉ | fluent |

### Graduate Scholarships

| 2022 – 2024 | ▉ | **Accelerated degree program scholarship** |
| 2023 | ▉ | **Academic research support ARF fellowship grant** |