Minjae Kwon

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Education

University of Virginia, Charlottesville, VA — Aug 2022 – Present
Ph.D. Candidate, Computer Science — (Expected May 2027)
Thesis: *Safe Decision-Making When the World Changes*

Kyungpook National University, Daegu, South Korea — Mar 2017 – Aug 2022
Ph.D. in Mathematics
Thesis: *On a Generalized Class of Noetherian Rings*

Kyungpook National University, Daegu, South Korea — Mar 2011 – Feb 2017
B.S. and M.S. in Mathematics
Thesis: *The Krull Dimension of Composite Power Series Rings over Valuation Rings*

Research Experience

University of Virginia, Charlottesville, VA — Aug 2022 – Present
Graduate Research Assistant, Department of Computer Science
Advisor: Lu Feng

- Lead research on **safe and generalizable reinforcement learning**, working on runtime safety, in-context learning, and deployment-time adaptation under distribution shift without extra retraining, with applications to simulated healthcare and robotics.
- Designed **reward functions for reinforcement learning** that incentivize partial completion of tasks specified in Linear Temporal Logic, addressing sparse-reward limitations in uncertain environments with applications to complex robotic tasks.

University of Toronto, Toronto, Canada — Sep 2021 – Feb 2022
Visiting Scholar (Mitacs Globalink Research Award, C$20,000)
Host: Chi-Guhn Lee

- Proposed a **recursive time-series data augmentation** method to address data scarcity, and proved bounds on the augmented model's expected error.

Kyungpook National University, Daegu, Korea — Mar 2015 – July 2022
Ph.D.& M.S. Student / Graduate Researcher, Department of Mathematics
Advisor: Jung Wook Lim

- Led research on **ring theory**, working on generalizations of Noetherian rings.

Peer-Reviewed Publications

[5] Amir Moeini*, **Minjae Kwon***, Alper Kamil Bozkurt, Yuichi Motai, Rohan Chandra, Lu Feng, Shangtong Zhang. *Safe In-Context Reinforcement Learning*. International Conference on Machine Learning (ICML), 2026.

[4] **Minjae Kwon**, Josephine Lamp, Lu Feng. *Safety Generalization Under Distribution Shift in Safe Reinforcement Learning: A Diabetes Testbed*. International Conference on Machine Learning (ICML), 2026.

[3] **Minjae Kwon**, Ingy ElSayed-Aly, Lu Feng. *Adaptive Reward Design for Reinforcement Learning*. Conference on Uncertainty in Artificial Intelligence (UAI), 2025.

[2] Amine Mohamed Aboussalah, **Minjae Kwon**, Raj G Patel, Cheng Chi, Chi-Guhn Lee. *Recursive Time Series Data Augmentation*. International Conference on Learning Representations (ICLR), 2023.

[1] **Minjae Kwon**, Jung Wook Lim. *On Nonnil-S-Noetherian Rings*. Mathematics, 8(9), 1428, 2020.

Preprints and Papers Under Review

[3] **Minjae Kwon**[*], Amir Moeini[*], Shangtong Zhang, Lu Feng. *Algorithm Distillation for Safe In-Context Reinforcement Learning*. Under review, 2026.

[2] **Minjae Kwon**[*], Amir Moeini[*], Shangtong Zhang, Lu Feng. *Latent Q-Barrier Shielding for Safe In-Context Reinforcement Learning*. Preprint, 2026.

[1] **Minjae Kwon**, Tyler Ingebrand, Ufuk Topcu, Lu Feng. *Adaptive Shielding for Safe Reinforcement Learning under Hidden-Parameter Dynamics Shifts*. Preprint, 2026.

[*]Equal contribution.

Honors, Awards, and Scholarships

Awards and Honors

- *Gold Reviewer Award*, International Conference on Machine Learning (ICML) 2026
- *Globalink Research Award*, National Research Foundation of Korea (NRF) and Mitacs 2021
- *Award for Presentation Excellence*, The Korea Society for Computational and Applied Mathematics 2019
- *Outstanding Participation Award*, Brain Korea 21 Plus 2017
- *Best Tutor Award*, Math Help Center, Kyungpook National University 2016
- *Award for Presentation Excellence*, TAPU (Graduate Student Workshop on Mathematics) 2016
- *Silver Medal*, 33rd Mathematics Competition for University Students, Korean Mathematical Society 2014

Scholarships

- *Conference Scholarship*, Conference on Uncertainty in Artificial Intelligence (UAI) 2025
- *Brain Korea 21 Research Scholarship*, Kyungpook National University 2015–2021
- *Graduate Scholarship* (admission with highest distinction), Kyungpook National University 2015
- *Scholarship for Academic Excellence*, Kyungpook National University 2014
- *Academic Support Scholarship*, Government of the Republic of Korea 2014
- *Scholarship for Academic Excellence*, Kyungpook National University 2012
- *Vision Scholarship*, Government of the Republic of Korea 2012
- *National Excellence Dream Scholarship*, Government of the Republic of Korea 2011
- *Alumni Scholarship*, Department of Mathematics, Kyungpook National University 2011

Talks

- "Safe Decision-Making When the World Changes" July 2026
  Korea Institute for Advanced Study, Seoul
- "Introduction to Deep Reinforcement Learning" Aug 2022
  Open Seminar on Algebras, Combinatorics and Algorithms, Virtual
- "Introduction to Mathematics for Artificial Intelligence" (outreach) July 2021
  Pohang Jecheol High School, Pohang
- "Deep Reinforcement Learning for Trading" Aug 2020
  The Korea Society for Computational and Applied Mathematics, Daejeon
- "Some Global Dimension of Power Series Rings over w-Coherent Rings" Aug 2019
  Mediterranean Conference on Pure and Applied Mathematics, Paris
- "Basic Properties of w-SFT-Rings" Oct 2018
  Joint Meeting of the Korean Mathematical Society and the German Mathematical Society, Seoul
- "Some Results on w-SFT-Rings" July 2018
  The 10th KOOK-TAPU Joint Seminar on Knots and Related Topics, Busan
- "Note on w-SFT Rings" June 2018
  Honam–Youngnam Mathematical Societies Meeting, Jeju

The Korea Society for Computational and Applied Mathematics, Daejeon

- "Note on Nonnil-S-Noetherian Rings" Apr 2018
  The Korean Mathematical Society Spring Meeting, Seoul
- "The Krull Dimension of Composite Power Series Rings over Valuation Rings" July, Oct 2017
  The 50th Symposium on Ring Theory and Representation Theory, Yamanashi
  The 9th KOOK-TAPU Joint Seminar on Knots and Related Topics, Osaka
- "On Nonnil-S-Noetherian Rings" Jan, Apr 2016
  The Korean Mathematical Society Spring Meeting, Suwon
  Joint Mathematics Meetings, Seattle

Teaching and Mentoring Experience

University of Virginia

Teaching Assistant

- Cyber-Physical Systems: Formal Methods, Safety & Security · CS 6763/SYS 6763 Spring 2024, Spring 2025
  Mentored final projects in explainable AI and safe reinforcement learning
- Artificial Intelligence · CS 4710 Fall 2023, Fall 2025
  Developed a Google Colab workflow for course assignments

Kyungpook National University

Teaching Assistant

- Modern Algebra I & Seminar · MATH413 Spring 2015, Spring 2016, Spring 2020
  Led lab sessions and co-designed midterm and final exams
- Modern Algebra II & Seminar · MATH414 Fall 2015, Fall 2016
  Led lab sessions and co-designed midterm and final exams
- Modern Algebra · MTED334 Fall 2017
- Applied Mathematics · MATH401 Spring 2017
- Introduction to Graph Theory · MATH420 Spring 2017
- Set Theory & Mathematical Logic · MATH292 Spring 2017, Fall 2017
- Number Theory · MATH235 Fall 2017
- Calculus I · CLTR211 Summer 2017, Winter 2017, Summer 2018, Spring 2020, Spring 2021
- Calculus II · CLTR212 Winter 2018, Winter 2019
- Linear Algebra I · MATH231 Spring 2018
- Special Topics in Geometry · MATH429 Fall 2019
  Created lecture slides

Guest Lectures

- Modern Algebra I & Seminar · MATH413 Spring 2015, Spring 2016, Spring 2020
  Groups and operations
- Modern Algebra II & Seminar · MATH414 Fall 2015, Fall 2016
  Rings and fields
- Linear Algebra I · MATH231 Spring 2018
  Matrix algebra and linear maps
- Set Theory & Mathematical Logic · MATH292 Spring 2017, Fall 2017
  Propositional logic and set operations
- Number Theory · MATH235 Fall 2017
  Modular arithmetic and prime numbers
- Calculus I · CLTR211 Summer 2017, Winter 2017, Summer 2018, Spring 2020, Spring 2021
  Infinite series and convergence tests

- Calculus II · CLTR212 Winter 2018, Winter 2019
  Double integrals, vector fields, Green's theorem, and Stokes' theorem

Tutor

- Math Help Center Fall 2015, Winter 2015, Spring 2016, Fall 2016, Spring 2018, Fall 2018
  Helped students taking Introductory Calculus and Calculus I–II, working with teaching professors

Mentor

- Gyunggu High School Mentoring Program Spring 2012, Fall 2012
  Visited students' homes and taught high school mathematics, mentoring high school life

Professional Activities

Reviewing:

AAAI Conference on Artificial Intelligence (AAAI)	2026
Transactions on Machine Learning Research (TMLR)	2026
Conference on Neural Information Processing Systems (NeurIPS)	2026
International Conference on Machine Learning (ICML)	2026
International Conference on Learning Representations (ICLR)	2026
Conference on Uncertainty in Artificial Intelligence (UAI)	2026
Reinforcement Learning Conference (RLC)	2026
International Conference on Robotics and Automation (ICRA)	2026
Hybrid Systems: Computation and Control, International Conference on Cyber-Physical Systems	2026
ACM Transactions on Cyber-Physical Systems (TCPS)	2024–2026
Filomat	2026
Rocky Mountain Journal of Mathematics	2026
Electronics and Telecommunications Research Institute (ETRI) Journal	2026

Technical Skills

- **Programming:** Python, C/C++
- **Scientific computing:** PyTorch, NumPy, SciPy, TensorFlow/Keras, JAX
- **Other:** LaTeX, Git, Linux