Jaehyeong KIM

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RESEARCH INTERESTS

Hydrological modeling, Sociohydrology, Climate change, Machine learning and Remote sensing

EDUCATION

Seoul National University of Science and Technology, Seoul, South Korea   Mar. 2025 – Present
M.S. in Environmental Engineering (Anticipated Jul. 2026)
- Integrated B.S.–M.S. Program
- Received Future Talent Scholarship (full tuition support)
- Master's Thesis (In progress): "*Exploring Sociohydrological Interactions in Agricultural Drainage Systems under Governance Design and Climate Change*" (Advisor: Prof. Hanseok Jeong)

Seoul National University of Science and Technology, Seoul, South Korea   Mar. 2019 – Mar. 2025
B.S. in Environmental Engineering
- Undergraduate Thesis: "*Quantification of Water Pollution Using Load Duration Curves Approach*" (Advisor: Prof. Hanseok Jeong)

PROFESSIONAL/RESEARCH EXPERIENCE

Seoul National University of Science and Technology, Seoul, South Korea   Mar. 2025 – Present
Graduate Research Assistant, Environmental Modeling Laboratory
- Developed a socio-hydrological model to analyze how climate change and spatial asymmetry influence interactions between humans and agricultural drainage systems, including collective action scenarios
- Conducted environmental news web crawling and text mining techniques to analyze social perceptions of river water quality, offering insights into socio-hydrological interactions

Seoul National University of Science and Technology, Seoul, South Korea   Sep. 2023 – Feb. 2025
Undergraduate Student Researcher, Environmental Modeling Laboratory
- Designed a multi-standard Load Duration Curve (LDC) method and implemented a Python-based automated tool for water quality assessment, incorporating proportional distribution of water quality grades, the proportion of "Good quality," and the rate of change in this proportion to enhance non-point source pollution assessment in South Korea
- Constructed a field-scale SWAT model to simulate tile drainage in the U.S. Midwest using QGIS and QSWAT, applying DEM and land-use data for watershed delineation and parameterization
- Developed a WASP8 model to explore water quality variations in the Nakdong River under scenarios with and without the Haman Weir and acquired hands-on experience in model setup, parameterization, and scenario analysis

Republic of Korea Army, Gangwon-do, South Korea   Feb. 2021 – Aug.2022
Water Purification Specialist, Corps of Engineers
- Installed and operated water purification equipment, including filtration and disinfection systems, to produce potable water at designated sites
- Selected and applied appropriate chemical agents according to source water quality characteristics
- Maintained and repaired key components and supporting equipment of purification units
- Calculated water demand and production capacity to ensure reliable potable water supply for supported units

PUBLICATIONS

Jaehyeong Kim, Kyungmin Kim, Hanseok Jeong. "*Development of a Framework for stream Water Quality Assessment Using Multi-Standard Load Duration Curves*" (Under review at Korean Water Resources Association (KWRA), Scopus-indexed journal)

CONFERENCES

Jaehyeong Kim, Kyungmin Kim, Pranay Ranjan, David J. Yu, Rabin Bhattarai, and Hanseok Jeong, *"Long-Term Socio-Hydrological Responses to Governance Design and Climate Change in Agricultural Drainage Systems"*, American Geophysical Union (AGU) Fall meeting 2025, New Orleans, USA, December 15 - 19, 2025 (Oral)

Jaehyeong Kim, Kyungmin Kim, and Hanseok Jeong, *"Stream Water Quality Assessment using Multi-Standard Load Duration Curves"*, Korea Water Resource Association (KWRA) Spring Conference 2025, Yeosu, South Korea, May 21 - 23, 2025 (Poster)

Jaehyeong Kim, Kyungmin Kim, Pranay Ranjan, David Yu, Rabin Bhattarai, and Hanseok Jeong, *"Understanding collective-Risk Social Dilemmas in Agricultural drainage Systems through a Socio-Hydrological Model"*, Joint Symposium on Environmental Engineering - SEOULTECH & Muroran Institute of Technology (JSEE) 2024, Online, January 10, 2025 (Poster)

Jaehyeong Kim, Kyungmin Kim, and Hanseok Jeong, *"A study on the Methodology for the Assessment of Nonpoint Source Pollution Using Load Duration Curves"*, Korea Society of Environmental Engineers (KSEE) Fall Conference 2024, Yeosu, South Korea, November 06 - 08, 2024 (Poster)

Jaehyeong Kim, Kyungmin Kim, Pranay Ranjan, David Yu, Rabin Bhattarai, and Hanseok Jeong, *"The Impact of Spatial Asymmetry and Drainage Governance Designs on the Performance of Agricultural drainage Systems"*, Korean Society of Agricultural Engineers (KSAE) Fall Conference 2024, Danyang, South Korea, October 30 – November 01, 2024 (Oral)

Jaehyeong Kim, Jungjin Kim, and Hanseok Jeong, *"Interpreting Runoff Characteristics and Water Quality Variations Using Human Social Sensing and Watershed Model"*, Korean Society of Agricultural Engineers (KSAE) Fall Conference 2024, Danyang, South Korea, October 30 – November 01, 2024 (Poster)

Jaehyeong Kim, Kyungmin Kim, Juseong Lee, Jungjin Kim, Hakkwan Kim, and Hanseok Jeong, *"Applicability of Load Duration Curve in non-point source pollution management"*, Korea Water Resource Association (KWRA) Spring Conference 2024, Jeju, South Korea, May 08 - 10, 2024 (Poster)

Kyungmin Kim, **Jaehyeong Kim,** David Yu, Rabin Bhattarai, and Hanseok Jeong, *"Development of a Socio-Hydrological Model to Explore the Interactions Between Humans and Agricultural Drainage Systems"*, 4th International Electronic Conference on Applied Sciences (ASEC2023), Muroran, Japan, January 14 – 17, 2024 (Poster)

AWARDS & HONORS

Graduate Student Abroad Internship Support Scholarship - Internship at University of Florida (Forthcoming), Seoul National University of Science and Technology   Dec. 2025

Plastic-Free Graduate Program Scholarship, Seoul National University of Science and Technology   Aug. *2025*

Best Poster Award, 2025 Annual Meeting of the Korea Water Resource Association (KWRA)   *May 2025*

Future Talent Scholarship, Seoul National University of Science and Technology   *Mar. 2025*

Best Undergraduate Research Presentation Award,
Dept. of Environmental Engineering, Seoul National University of Science and Technology   *Nov. 2024*

Best Presentation Award, 2024 Annual Meeting of the Korean Society of Agricultural Engineers (KSAE)   *Nov. 2024*

PROFICIENCY IN SKILLS

Language: Korean, English
Computer Language: Python, MATLAB, R, JavaScript
GIS Software: QGIS, ArcGIS
Hydrological Modeling Software: SWAT (Soil and Water Assessment Tool), WASP (Water Quality Analysis Simulation Program)

TEACHING EXPERIENCES

Seoul National University of Science and Technology, Seoul, Korea
Teaching Assistant, Department of Environmental Engineering

Capstone Design   Mar. 2025 – Present
- Guided undergraduate students in designing and developing research concepts
- Proofread and provided feedback on bachelor's theses

AI and Physically-Based Plastic Pollution Prediction   Mar. 2025 – Jun. 2025
- Attended lectures and offered in-class support by addressing student queries
- Assisted in grading assignments and reports

Big data and Environmental Modeling   Mar. 2025 – Jun. 2025
- Conducted WASP8 tutorials and developed instructional materials
- Provided individual support to students during lab sessions to help students apply course concepts
- Addressed students' inquiries through regular email counseling and in-person office hours

Environmental Fluid Mechanics   Sep. 2024 – Dec. 2024
- Assisted in lectures and offered in-class support for student learning

ON-CAMPUS LEADERSHIP ACTIVITIES

Seoul National University of Science and Technology, Seoul, Korea   Mar. 2019 – Feb. 2021
Student Council Member, *Department of Environmental Engineering*
- Managed student council funds and assisted with departmental administrative operations
- Organized departmental events and implemented student welfare initiatives to enhance student engagement and well-being