Kihong Park

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Department of Civil Engineering
General Graduate School
Chung-Ang University
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RESEARCH INTERSESTS

- Hydrological Modeling
  - *Water Sensitive Urban Design*
  - *Nature-based Solutions*
  - *Urban Stormwater Management*
  - *Rainfall-Runoff Analysis*
  - *Hydrological Process and Mechanism*
- Climate Change
  - *Terrestrial Water Storage*
  - *Hydrologic Impact and Response*
  - *Microclimate Analysis*
  - *Wastewater Heat*
  - *Water-Energy Nexus*
- Disaster & Risk Management
  - *Drought and Floods Management*
  - *Damage Cost Estimation*
  - *Risk and Reliability Analysis*
  - *Compound Urban Disaster*

EDUCATION

Ph.D. Student, Chung-Ang University **Seoul, Republic of Korea**

Department of Civil Engineering, General Graduate School

- March 2023 – Present
- Major: Water Resources and Coastal Engineering (under supervision of Prof. Changhyun Jun)

Master's Degree, Chung-Ang University **Seoul, Republic of Korea**

Department of Civil Engineering, General Graduate School

- March 2021 – February 2022
- Major: Water Resources and Coastal Engineering (under supervision of Prof. Changhyun Jun)
- Title: Research on Evaluating and Prioritizing Wastewater Treatment Facilities for the Introduction of Sewage Energy Based on Terrain Spatial Information and Approximate Construction Costs

Bachelor of Science, Chung-Ang University **Seoul, Republic of Korea**

Department of Civil and Environmental Engineering, College of Engineering

- March 2015 – February 2021

PEER-REVIEWED PUBLICATIONS

- **Published (in Korean)**

  [1] Lee, J-H., **Park, K-H.**, Jun, C., Oh, J., 2021: Risk Assessment for Inland Flooding in a Small Urban Catchment: Focusing on the Temporal Distribution of Rainfall and Dual Drainage Model. ***Journal of Korean Society of Water & Wastewater***, 35(6), pp. 389-403, DOI: 10.11001/jksww.2021.35.6.389.

- **Under Review**

  - **Park, K-H.**, Jun, C., Oh, J., 2023: Evaluation and Priority Determination of Wastewater Treatment plants from Wastewater Heat Recovery for Maximum Reuse of Treated Wastewater: Focusing on Gross Floor Area nearby Wastewater Treatment Plants. ***Journal of Korean Society of Water & Wastewater***

- **In Preparation**

  - **Park, K-H.**, Kim, H-J., Baik, J., Jun, C., 2024: Interactive Impact of Aspect Ratio and Vegetation in Street Canyons on Heat and PM10 Reduction. ***Journal of Korean Association of Geographic Information Studies***
  - **Park, K-H.**, Kim, H-J., Baik, J., Jun, C., 2024: Urban Forests as Catalysts for Mitigating Compound Urban Crises - A Focus on Floods, Air Pollution, and Human Thermal Comfort. ***Cities***
  - **Park, K-H.**, Kim, H-J., Baik, J., Jun, C., 2024: Analysis of Resilience to Urban Compound Disasters Through the Implementation of Nature-based Solutions. ***Cities***
  - **Park, K-H.**, Kim, H-J., Baik, J., Jun, C., 2024: Assessing Urban Compound Disaster Impacts Based on Local Climate Zone Using CFD Models: Focusing on Flood and Heatwave. ***Cities***
  - **Park, K-H.**, Kim, H-J., Baik, J., Jun, C., 2024: Analysis of Urban Compound Disaster Process with Local Climate Zone. ***Urban Climate***
  - **Park, K-H.**, Baik, J., Jun, C., 2024: Machine Learning-Based Local Climate Zone Classification with Remote Sensing Data in Korea. ***Urban Climate***

CONFERENCE PAPERS AND PRESENTATIONS

- **Published (in English)**

  - [7] **Park, K-H.**, Jun, C., Oh, J., 2023: Sustainable Water-Energy Nexus: A GIS-Based Spatial Analysis for Wastewater Heat Recovery and Reuse from Wastewater Treatment Plants in South Korea. ***AGU (American Geophysical Union) Fall Meeting 2023*** (December 11-Decmber 15, 2023) – San Francisco, USA.
  - [6] **Park, K-H.**, Kim, H-J., Baik, J., Jun, C., 2023: Investigating the Synergetic Effect of Aspect Ratio and Vegetation in Street Canyon on Heat and PM10 Mitigation. ***The 11th ICUC (International Conference on Urban Climate) 2023*** (August 28 – September 1, 2023) – UNSW Sydney, Australia.
  - [5] Kim, H-J., **Park, K-H.**, Baik, J., Lee, J., Jun, C., 2023: The Effect of Moist Air Inflow in Low Levels Near the Coastal Urban Area on Extreme Precipitation with Thunderstorms. ***The 11th ICUC (International Conference on Urban Climate) 2023*** (August 28 – September 1, 2023) – UNSW Sydney, Australia.
  - [4] Byun, J., Kim, H-J., Lee, J., Baik, J., **Park, K-H.**, Jun, C., 2023: A Novel Approach for Image-based Rainfall Estimation with GAN and VAE: Focusing on Rain Streak Detection, Removal, and Generation. ***Asia Oceania Geosciences Society (AOGS) 20th Annual Meeting (AOGS 2023)*** (July 30 – August 4, 2023) – Singapore.
  - [3] **Park, K-H.**, Kim, H-J., Jun, C., 2023: The Role of Urban Forests in Compound Urban Crises: Focusing on Floods, Air Pollution, and Human Thermal Comfort. ***EGU General Assembly 2023*** (April 23-28, 2023) – Vienna, Austria.
  - [2] Cha, H., Baik, J., Kim, J., Lee, J., Byun, J., **Park, K-H.**, Sung, J., Hwang, S., Jun, C., 2022: An Investigation on the Relationship between Integrated Water Vapor and Standardized Precipitation Index: A Case Study of the Northern Part of Africa. ***The MedGU Annual Meeting*** (November 27-30, 2022) – Marrakech, Morocco.
  - [1] Lee, J., Baik, J., Byun, J., **Park, K-H.**, Jun, C., 2022: Assessment of Probability Precipitation Using High Resolution Precipitation Dataset in Korean Peninsula. ***Water Safety Conference 2022*** (June 22-24, 2022) – Narvik, Norway.

- **Published (in Korean)**

  - [7] Cha, H., Baik, J., Lee, J., **Park, K-H.**, Kim, H-C., Jun, C., 2023: Sensitivity Analysis of Emergency Water Supply Quantity for Domestic Use: Focusing on Meteorological Influencing Factors. ***Korean Society of Civil Engineering*** (November 18-20, 2023) – Yeosu, South Korea.
  - [6] **Park, K-H.**, Baik, J., Kim, H-J., Cha, H., Jun, C., 2023: Unveiling the Intricacies of Urban Heat Island Dynamics through Soil Moisture Variability modulated by Meteorological Drought. ***2023 Korea Water Resources Association Conference*** (May 25-26, 2023) – Goseong, Korea.
  - [5] Cha, H., Baik, J., Lee, J., **Park, K-H.**, Jun, C., 2023: Unveiling the Susceptibility of Agricultural Drought Damages in Hoseo: A Profound Analysis on Sensitivity towards. ***2023 Korea Water Resources Association Conference*** (May 25-26, 2023) – Goseong, Korea.
  - [4] **Park, K-H.**, Jun, C., Oh, J., 2022: Wastewater Heat Energy Utilization Plan for Expanded Application of Wastewater Reuse: Focusing on GIS-based Gross Floor Area Analysis. ***The 5th Water Engineering Conference*** (December 26-29, 2022) – Seoul, Korea.
  - [3] Sung, J., Lee, J., Byun, J., **Park, K-H.**, Jun, C., 2022: Estimation of Peak Time and Peak Discharge Using Rational Method Considering Storage Effect. ***2022 Korea Water Resources Association Conference*** (May 19-20, 2022) – Busan, Korea.
  - [2] Baik, J., **Park, K-H.**, Hwang, S., Cha, H., Jun, C., 2021: Adequacy of the GK-2A AMI Land Surface Temperature Product According to Geographic Factors and Compared with Other Satellite Products. ***The 4th Water Engineering Conference*** (December 20-23, 2021) – Online Conference.
  - [1] **Park, K-H.**, Jun, C., 2021: Methods for Improving Accuracy of Rainfall Prediction: Focus on the ARIMA Model. ***2021 Korea Wetlands Society Conference*** (November 18-20, 2021), Korea.

PATENT

- [1] **Park, K-H.**, Oh, J., Jun, C., 2022: Heat Harvesting Apparatus by Water Heat Recovery. **10-2022-0040224**.

HONORS AND AWARDS

- **Best Paper Award**
  - 2022 Korea Water Resources Association Conference (May 20, 2022)
    - Title: Peak Time and Peak Discharge Using Rational Method Considering Storage Effect
  - 2020 Undergraduate Writing in Chung-Ang University (November 13, 2020)
    - Title: Rainfall Prediction for 2020 Using ARIMA Model
- **Excellence Award**
  - ICAN-LABs, 2022 Conference of Exploring Graduate Start-ups, (November 19, 2022)
    - Title: CCTV-Based Waste Management System
  - Water Idea Contest for Climate Change Adaptation and Carbon Neutrality, Korea Water and Wastewater Works Association (February 9, 2022)
    - Title: Water-Energy Station Based on Water-Energy Nexus for Urban Wastewater Heat Utilization

TECHNICAL SKILLS

- **Programing Languages**
  - Python (Data Structures and Handling, Library Usage, Web Scraping and API Integration, etc.)
  - MATLAB (Data Structures and Handling, Library Usage, Data Analysis and Visualization, etc.)
- **CFD Models**
  - XP-SWMM (Dual Drainage Model)
  - ENVI-met (Urban Microclimate Model)
  - OpenFOAM (Fluid Flow, Heat Transfer and Chemical Reactions)
- **Software**
  - QGIS (GIS Handling and Analysis)

RESEARCH PROJECTS INVOLVED

National Research Foundation of Korea

- Title: “Development of an Algorithm with AI and Unconstructed Big Data for High-Quality Hydro-Meteorological Data: Focusing on Improvement of Accuracy in Flood Estimation”
- Position: Research Assistant
- Responsibilities: Derivation of Flood Impact Factors through GIS and Ground Observation Data
- Period: June 2023 –

Korea Meteorological Institute

- Title: “Development of Key Techniques and Utilization Methods for Weather Observation in Rain/Snow Fields based on Unstructured Data using CCTV”
- Position: Research Assistant
- Responsibilities: Decision-Making Strategies for Early Warning Systems during Rainfall and Snowfall Events
- Period: March 2023 –

National Research Foundation of Korea

- Title: “Development of the Integrated Solution for Smart Flood Management using Digital Twin Technology based on Supercomputing”
- Position: Research Assistant
- Responsibilities: Extraction of Flood Information from Social Media (Text and Image) Using Web Crawling and Natural Language Processing
- Period: June 2022 –

Korea Environmental Industry and Technology Institute

- Title: “Development of Scenario Neutral-based Drought Vulnerability Evaluation Technology for Multilateral Decision Making”
- Position: Research Assistant
- Responsibilities: Identification of Drought Determinants and Decision-Making Approaches
- Period: April 2022 –

Korea Meteorological Administration

- Title: “Research for Rainfall Estimation Using CCTV Videos”
- Position: Research Assistant
- Responsibilities: Setup and Implementation of CCTV-based Rainfall Intensity Observation System
- Period: March 2021 – April 2022

Korea Environmental Industry and Technology Institute

- Title: “Development of Next Generation Technology for Sewer Condition Assessment and Asset Management based on Cloud Computing”
- Position: Research Assistant
- Responsibilities: Assessing Urban Inland Flood Risk Using Hydrological Modeling and Utilization Wastewater Heat and Water Reuse based on Water-Energy Nexus
- Period: March 2021 – February 2023

National Research Foundation of Korea

- Title: “Development of AI-based Microclimate Analysis and Prediction Methods for Water Sensitive Urban Design”
- Position: Research Assistant
- Responsibilities: Microclimate Analysis of Water Sensitive Urban Design Techniques Using ENVI-met
- Period: March 2021 – February 2023

TEACHING

Postgraduate Teaching Assistant, Chung-Ang University **Seoul, South Korea**

Department of Civil and Environmental Engineering, College of Engineering

- March 2021 – June 2023 (Engineering Mathematics, Hydrology, Hydrodynamics, Risk and Reliability Analysis for Hazard Mitigation)