Seokhyeon Kim

Research Associate, Ph.D., M.Eng.

- UNSW Water Research Centre, School of Civil and Environmental Engineering, University of New South Wales (UNSW) Sydney, NSW 2052, Australia
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Education

- **Doctor of Philosophy** (Hydrology and Water Resources Engineering) || Jul. 2013 – Nov. 2017
  - School of Civil and Environmental Engineering, UNSW Sydney, NSW, Australia
    (UNSW Sydney ranking in 2021 – QS: 44th; QS (civil engineering): 11th; AWRU (water resources): 5th)
  - Thesis title: *Improvements and applications of satellite-derived soil moisture for flood forecasting*
  - Supervisors: Ashish Sharma, Fiona Johnson, Yi Y. Liu (co-supervisor)
- **Master of Engineering** (Water Resources Engineering) || Mar. 2006 – Feb. 2008
  - School of Civil and Environmental Engineering, Korea University, Seoul, Republic of Korea
  - Thesis title: *Study for Improving Water Distribution System Reliability*
  - Supervisor: Joong Hoon Kim
- **Bachelor of Engineering** (Civil and Environmental Engineering) || Mar. 1997 – Feb. 2001
  - School of Civil and Environmental Engineering, Korea University, Seoul, Republic of Korea

Professional Appointments

- **Associate Manager ||** Water resources engineering in Hyundai Engineering and Construction Co., Ltd., Seoul, Korea || Jan. 2008 – Jul. 2013

Military services (compulsory)

- **Platoon leader & intelligence officer (1st lieutenant) ||** Republic of Korea Army || Jul. 2001 – Sept. 2004

Publication

[IF: Impact Factor/C: #Citations from Google Scholar]

❖ **Journal publication**

[1] **S. Kim**, A. Anabalón, A. Sharma. (2020) An Assessment of Concurrency in Evapotranspiration Trends Across Multiple Global Datasets, *Journal of Hydrometeorology*, Published (online), **[IF:3.891/C:0]**

[2] **S. Kim**, H. Pham, Y. Liu, L. Marshall, A. Sharma. (2020). Improving the combination of satellite soil moisture datasets by considering error cross-correlation: A comparison between triple collocation (TC) and extended double instrumental variable (EIVD) alternatives, *IEEE Transactions on Geoscience and Remote Sensing*, Published (online), **[IF:6.120/C:0]**

[3] S. Kim, R. Mehrotra, **S. Kim**, A. Sharma. (2020) Probabilistic forecasting of Cyanobacterial concentration in riverine systems using environmental drivers, *Journal of Hydrology*, Published (online), **[IF:4.405/C:0]**

[4] R. Zhang, **S. Kim [corr-auth]**, A. Sharma, V. Lakshmi. (2020). Identifying relative strengths of SMAP, SMOS-IC, and ASCAT to capture temporal variability using a model combination approach, *Remote Sensing of Environment*, 252, 112126, **[IF:8.218/C:0]**

[5] **S. Kim**, H. Ajami, A. Sharma. (2020). Using remotely sensed information to improve vegetation parameterization in a semi-distributed hydrological model (SMART) for upland catchments in Australia, *Remote Sensing*, 12(18), 3501, **[IF: 4.509/C:0]**

[6] B. Magan, **S. Kim**, C. Wasko, R. Barbero, V. Moron, R. Nathan, A. Sharma. (2020). Impact of atmospheric circulation on the rainfall-temperature relationship in Australia, *Environmental Research Letters*, 15(9), 094098, **[IF: 6.192/C:0]**

[7] S. Moradi, A. Agostino, Z. Gandomkar, **S. Kim**, L. Hamilton, A. Sharma, R. K. Henderson, and G. Leslie. (2020). Quantifying natural organic matter concentration in water from climatological parameters using different machine learning algorithms, *H2Open Journal*, 3(1), 328-343, **[IF: NA/C:0]**

[8] **S. Kim**, S. Eghdamirad, A. Sharma, J. H. Kim. (2020). Uncertainty Quantification of uncertainty in projections of extreme daily precipitation, *Earth and Space Science*, 2020, e2019EA001052-T, **[IF: 2.15/C:2]**

[9] D. Hagan, G. Wang, **S. Kim**, R. Parinussa, Y. Liu, W. Ullah, S. Bhatti, X. Ma, T. Jiang, B. Su. (2020). Maximizing Temporal Correlations in Long-Term Global Satellite Soil Moisture Data Merging, *Remote Sensing*, 12 (13), 2164, **[IF: 4.509/C:1]**

[10] S. Kim, **S. Kim [corr-auth]**, R. Mehrotra, A. Sharma. (2020). Predicting cyanobacteria occurrence using climatological and environmental controls, *Water Research*, 175, 115639, **[IF:7.913/C:1]**

[11] T. Kim, T. Ley, S. Kang, J. Davis, **S. Kim**, P. Amrollahi. (2020). Using Particle Composition of Fly Ash to Predict Strength and Resistivity of Concrete, *Cement and Concrete Composites*, 107, 103493, **[IF:5.127/C:4]**

[12] **S. Kim**, R. Zhang, H. Pham, A. Sharma. (2019). A review of satellite-derived soil moisture and its usage for flood estimation, *Remote Sens Earth Syst Sci*, 2, 225–246, **[IF: NA/C:4]**

[13] **S. Kim**, H. D. Jun, D. G. Yoo, J. H. Kim. (2019). A framework for improving reliability of water distribution systems based on a segment-based minimum cut-set approach, *Water*, 11(7), 1524, **[IF:2.524/C:1]**

[14] H. Pham, **S. Kim**, F. Johnson, L. Marshall. (2019). Using 3D robust smoothing to fill land surface temperature gaps at the continental scale, *Int J Appl Earth Obs Geoinf*, 82, 10879, **[IF:4.846/C:3]**

[15] R. Zhang, **S. Kim [corr-auth]**, A. Sharma. (2019). A comprehensive validation of the SMAP Enhanced Level-3 Soil Moisture product using ground measurements over varied climates and landscapes, *Remote Sensing of Environment*, 223, 82-94, **[IF:8.218/C:19]**

[16] **S. Kim**, A. Sharma. (2019). The role of floodplain topography in deriving basin discharge using passive microwave remote sensing, *Water Resources Research*, 55(2), 1707-1716, **[IF:4.14/C:4]**

[17] U. Khan, H. Ajami, N. Tuteja, A. Sharma, **S. Kim**. (2018). Catchment Scale Simulations of Soil Moisture Dynamics Using an Equivalent Cross-Section based Hydrological Modelling Approach, *Journal of Hydrology*, 564, 944-966, **[IF:4.405/C:10]**

[18] **S. Kim**, K. Paik, F. Johnson, A. Sharma. (2018). Building a flood warning framework for ungauged locations using low resolution, open access remotely sensed surface soil moisture, precipitation, soil and topographic information, *IEEE J. of Selected Topics in Applied Earth Observations and Remote Sensing*, 11(2), 375-387, **[IF:3.392/C:15]**

[19] **S. Kim**, K. Balakrishnan, Y. Liu, F. Johnson, A. Sharma. (2017). Spatial Disaggregation of Coarse Soil Moisture Data by Using High Resolution Remotely Sensed Vegetation Products, *IEEE Geoscience and Remote Sensing Letters*, 14(9), 1604-1608, **[IF:3.534/C:10]**

[20] A. Silva, K. Subasinghe, C. Rajapaksha, K. Raveenthiran, **S. Kim,** M. Young, H. N. R. Perera, S. Araki (2016). Assessment of Design Alternation via 2D Physical Modelling in the Main Breakwater of Colombo Port Expansion Project. *Journal of Japan Society of Civil Engineers, Ser. B2 (Coastal Engineering)*, 72(2), I_1129-I_1134, **[IF: NA/C:0]**

[21] **S. Kim**, R. Parinussa, Y. Liu, F. Johnson, A. Sharma. (2016). Merging Alternate Remotely-Sensed Soil Moisture Retrievals Using a Non-Static Model Combination Approach, *Remote Sensing*, 8 (6), 518, **[IF: 4.509/C:8]**

[22] **S. Kim**, R. Parinussa, Y. Liu, F. Johnson, A. Sharma. (2015). A framework for combining multiple soil moisture retrievals based on maximizing temporal correlation, *Geophysical Research Letters*, 42 (16), 2015GL064981, **[IF:4.58/C:25]**

[23] **S. Kim**, Y. Liu, F. Johnson, R. Parinussa, A. Sharma. (2015). A global comparison of alternate AMSR2 soil moisture products: Why do they differ? *Remote Sensing of Environment*, 161 (0), 43-62, **[IF: 8.218/C:103]**

[24] H. D. Jun, **S. Kim**, D. G. Yoo, J. H. Kim. (2009). Evaluation of the reliability improvement of a water distribution system by changing pipe, *Journal of Korea Water Resources Association*, 42 (6), 505-511, **[IF: NA/C:5]**

❖ **Conference paper**

[1] M. Young, J. Hayman-Joyce, **S. Kim**. (2012). Use of Single Layer Concrete Armour Units as Toe Reinforcement, *Proceedings of the Coastal Engineering Conference*, 1 (33), 48, **[IF: NA/C:3]**

❖ **Under review**

[1] **S. Kim**, S. Young, A. Sharma. On the fusion of satellite soil moisture retrievals: how does maximizing correlation differ from minimizing mean squared error? submitted to *Water Resources Research*.

[2] S. Kim, R. Mehrotra, **S. Kim**, A. Sharma. Assessing countermeasure effectiveness in controlling cyanobacterial exceedance in riverine systems using probabilistic forecasting alternatives, submitted to *ASCE Journal of Water Resources Planning and Management.*

[3] **S. Kim**, H. Pham, A. Sharma. A generalization of N-tuple collocation of multiple global soil moisture products without need for a reference, submitted to *Remote Sensing of Environment.*

Presentations (1st author only)

[1] **S. Kim**, R. Zhang, A. Sharma, V. Lakshmi. Improvements of satellite observations through data merging: status and challenges, *American Geophysical Union (AGU) fall meeting 2020*, San Francisco, CA, USA

[2] **S. Kim**, H. Pham, Y. Liu, A. Sharma, L. Marshall. Combining geophysical variables for maximizing temporal correlation without reference data, *The 23rd International Congress on Modelling and Simulation (MODSIM2019)*, Canberra, Australia

[3] **S. Kim [Invited]**, Y. Guo, C. Wasko, A. Sharma. On soil moisture, rain and flood extremes in a warming climate – using satellite remote sensing to define future antecedent conditions, *The Korean Society of Climate Change Research (KSCC) 2018*, Jeju, Republic of Korea

[4] **S. Kim**, H. Ajami, A. Sharma. Incorporating an operational satellite-derived leaf area index into a computationally efficient semi-distributed hydrologic modelling application (SMART), *The 22nd International Congress on Modelling and Simulation (MODSIM2017)*, Hobart, Australia

[5] **S. Kim**, Y. Liu, F. Johnson, A. Sharma. A temporal correlation-based approach for spatial disaggregation of remotely sensed soil moisture, *American Geophysical Union (AGU) fall meeting 2016*, San Francisco, CA, USA

[6] **S. Kim**, Y. Liu, F. Johnson, R. Parinussa, A. Sharma. Reducing Structural Uncertainty in AMSR2 Soil Moisture Using a Model Combination Approach, *American Geophysical Union (AGU) fall meeting 2014*, San Francisco, CA, USA

[7] **S. Kim**, Y. Liu, F. Johnson, R. Parinussa, A. Sharma. Improvement of Soil Moisture Dataset Combining AMSR2 Soil Moisture Products, *The Australian Energy and Water Exchange Initiative (OzEWEX) 2014*, Canberra, ACT, Australia

Awards & Scholarship

- **Postgraduate Writing Fellowship** (AUD 6,500) || UNSW Sydney, NSW, Australia || May 2017 – Aug. 2017
- **Tuition Fee and Top-up Scholarship ||** UNSW Sydney, NSW, Australia || Jul. 2013 – Jan. 2017
- **Administrative Assistant Scholarship ||** Korea University, Seoul, Republic of Korea || Fall Semester, 2007
- **GS E&C Corporation Scholarship** || GS Engineering & Construction Corporation, Seoul, Republic of Korea || Fall Semester, 2006
- **The Second Stage of Brain Korea 21 Scholarship** || The Brain Korea 21, National Research Foundation of Korea, Daejeon, Republic of Korea || Spring Semester, 2006

Certification

- **Professional Engineer – Skill Level 1 Civil Engineer ||** Engineers Australia || Apr. 2018
- **Engineer Civil Engineering ||** Human Resources Development Service of Korea || Oct. 2000

Languages

Korean, English

Skills & Expertise

Satellite remote sensing, hydrology, water system, optimization, MATLAB, Python, ArcGIS

Research Experience

- **Research Associate ||** UNSW, Sydney, Australia || Apr. 2017 –
  - Hydrologic applications of satellite-derived data
- **Ph.D. Student ||** UNSW, Sydney, Australia || Jul. 2013 – Mar. 2017
  - Improvements and applications of satellite-derived soil moisture for flood forecasting
- **Master Student ||** Korea University, Seoul, Republic of Korea || Mar. 2006 – Feb. 2008
  - Improving water distribution system reliability

Teaching Experiences

- **Post-Doctoral Teaching Assistant ||** UNSW Sydney, Australia || Jul. 2017 –
  - Teaching, coordinating and consulting for *Catchment and Water Resources Modelling*, *Water Resources Engineering*; Academic supervision of masters/honours students
- **Teaching Assistant ||** UNSW Sydney, Australia || Jul. 2013 – Mar. 2017
- **Teaching Assistant ||** Korea University, Seoul, Republic of Korea || Mar. 2006 – Feb. 2008

Professional activities

- **Reviewer for Scholarly Journal**: International Journal of Applied Earth Observation and Geoinformation; Journal of Hydrology; Remote Sensing of Environment; Stochastic Environmental Research and Risk; PLOS ONE; KSCE Journal of Civil Engineering; ISPRS Journal of Photogrammetry and Remote Sensing; Environmental Research Letters
- **Conference session convener**: Asia Oceania Geosciences Society (AOGS) 2020
- **Professional membership**: Member, Engineers Australia (EA); Member, Australian Water Association (AWA); Member, Korea Water Resources Association (KWRA); Member, Korean Society of Civil Engineers (KSCE)

Projects Involved

- **Research Associate ||** UNSW Sydney, Australia || Apr. 2017 –
  - Australian Research Council (ARC) Discovery Project (DP) || *Assessing Water Supply Security in a Nonstationary Environment*, (DP200101326) || May 2020 –
  - ARC DP || *A Fourier approach to address low-frequency variability bias in hydrology*, (DP180102737) || May 2019 – April 2020
  - ARC Linkage Project, funded by WaterNSW and Sydney Water || *Adapting catchment monitoring and portable water treatment to climate change* (LP160100620) || Apr. 2017 – May 2019
- **Ph.D. candidate ||** UNSW Sydney, Australia || Jul. 2013 – Mar. 2017
  - ARC DP || *Reducing Flood Loss –Data Assimilation Framework for Improving Forecasting Capability in Sparsely Gauged Regions* (DP140102394) || Jul. 2013 – Mar. 2017
  - *Soil Moisture Active Passive Experiment – the 4th campaign* ***(SMAPEx-4)*** **||** May 2015

Referees

- **Professor Ashish Sharma**
  - Relation: Ph.D. and current supervisor
  - Affiliation: School of Civil and Environmental Engineering, UNSW Sydney
  - Email: a.sharma@unsw.edu.au

- **A/Professor Fiona Johnson**
  - Relation: Ph.D. supervisor
  - Affiliation: School of Civil and Environmental Engineering, UNSW Sydney, Sydney
  - Email: f.johnson@unsw.edu.au

- **Professor Yi Liu**
  - Relation: Ph.D. co-supervisor
  - Affiliation: School of Geographical Sciences, Nanjing University of Information Science and Technology (NUIST)
  - Email: yi.liu@nuist.edu.cn

- **Dr. Raj Mehrotra**
  - Relation: senior researcher in research group
  - Affiliation: School of Civil and Environmental Engineering, UNSW Sydney, Sydney
  - Email: raj.mehrotra@unsw.edu.au

- **Dr. Robert Parinussa**
  - Relation: former senior researcher in research group
  - Affiliation: Johan Cruyff Institute, Amsterdam, Netherlands
  - Email: robertparinussa@cruyffinstitute.org