Seokhyeon Kim

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

- Water Research Centre, School of Civil and Environmental Engineering, UNSW Sydney, NSW 2052, Australia
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Education

- **Ph.D.** (Water Resources Engineering and Remote Sensing) || Jul 2013 – Nov 2017
  - School of Civil and Environmental Engineering, UNSW Sydney, NSW, Australia
    (QS: 43rd; QS (civil engineering): 12nd; ARWU (water resources): 8th)
  - Thesis: *Improvements and applications of satellite-derived soil moisture for flood forecasting*
  - Supervisors: Ashish Sharma, Fiona Johnson (joint), Yi Liu (co)
- **M.Eng.** (Water Resources Engineering) || Mar 2006 – Feb 2008
  - School of Civil and Environmental Engineering, Korea University, Seoul, Republic of Korea
  - Thesis: *Study for Improving Water Distribution System Reliability*
  - Supervisor: Joong Hoon Kim
- **B.Eng.** (Civil and Environmental Engineering) || Mar 1997 – Feb 2001
  - School of Civil and Environmental Engineering, Korea University, Seoul, Republic of Korea

Professional Experiences

- **Associate manager** || Water resources engineering in HDEC, Seoul, Republic of Korea || Jan 2008 – Jul 2013
- **Compulsory military service (1st lieutenant)** || Republic of Korea Army || Jul 2001 – Sept 2004

Publication

[IF-JCR2020/#Citations]

1. Yoon H.N., Marshall L., Sharma A., **Kim S.** (2021). Bayesian model calibration using surrogate streamflow in ungauged catchments, *Water Resour. Res.*, 57, e2021WR031287, **[5.240/0]**
2. Lee S., **Kim S.**, and Moon S., Development of Car-free Street Mapping (CfSM) Model using an Integrated System with Unmanned Aerial Vehicle, Aerial Mapping Camera and Deep Learning Algorithm, *J. Comput. Civ. Eng.*, Accepted, **[4.640/0]**
3. **Kim S.**, Sharma, A., Liu, Y., Young, S. I. (2021). Rethinking Satellite Data Merging: From Averaging to SNR Optimization, *IEEE Trans. Geosci. Remote Sens.*, Early Access, 1–15, **[5.600/1]**
4. **Kim S.**, Dong J., Sharma A. (2021) A triple collocation-based comparison of three L-band soil moisture datasets, SMAP, SMOS-IC, and SMOS, over varied climates and land covers, *Front. Water.*, 3, 64, **[–/1]**
5. Kim S., Mehrotra R., **Kim S.**, Sharma A. (2021) Assessing countermeasure effectiveness in controlling cyanobacterial exceedance in riverine systems using probabilistic forecasting alternatives, *J. Water Resour. Plan. Manag.*, 147(10), 04021062, **[3.054/0]**
6. Kim S., Mehrotra R., **Kim S.**, Sharma A. (2021) Probabilistic forecasting of Cyanobacterial concentration in riverine systems using environmental drivers, *J. Hydrol.*, 593, 125626, **[5.722/1]**
7. Zhang R., **Kim S.**, Sharma A., Lakshmi V. (2021). Identifying relative strengths of SMAP, SMOS-IC, and ASCAT to capture temporal variability using a model combination approach, *Remote Sens. Environ.*, 252, 112126, **[10.164/5]**
8. **Kim S.**, Anabalón A., Sharma A. (2021) An Assessment of Concurrency in Evapotranspiration Trends Across Multiple Global Datasets, *J. Hydrometeorol.*, 22(1), 231–244, **[4.349/4]**
9. **Kim S.**, Pham H., Liu Y., Marshall L., Sharma A. (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 Trans. Geosci. Remote Sens.*, 59(9), 7285–7295, **[5.600/3]**
10. Magan B., **Kim S.**, Wasko C., Barbero R., Moron V., Nathan R., Sharma A. (2020). Impact of atmospheric circulation on the rainfall-temperature relationship in Australia, *Environ. Res. Lett.*, 15(9), 094098, **[6.793/6]**
11. Kim S., **Kim S.**, Mehrotra R., Sharma A. (2020). Predicting cyanobacteria occurrence using climatological and environmental controls, *Water Res.*, 175, 115639, **[11.236/10]**

12. Kim T., Ley T., Kang S., Davis J., **Kim S.**, Amrollahi P. (2020). Using Particle Composition of Fly Ash to Predict Strength and Resistivity of Concrete, *Cem. Concr. Compos.*, 107, 103493, **[7.586/14]**
13. **Kim S.**, Ajami H., Sharma A. (2020). Using remotely sensed information to improve vegetation parameterization in a semi-distributed hydrological model (SMART) for upland catchments in Australia, *Remote Sens.*, 12(18), 3501, **[4.848/2]**
14. Moradi S., Agostino A., Gandomkar Z., **Kim S.**, Hamilton L., Sharma A., Henderson R., and Leslie G. (2020). Quantifying natural organic matter concentration in water from climatological parameters using different machine learning algorithms, *H2Open Journal*, 3(1), 328-343, **[–/4]**
15. **Kim S.**, Eghdamirad S., Sharma A., Kim J. H. (2020). Quantification of uncertainty in projections of extreme daily precipitation, *Earth and Space Sci.*, 2020, e2019EA001052-T, **[2.900/9]**
16. Hagan D., Wang G., **Kim S.**, Parinussa R., Liu Y., Ullah W., Bhatti S., Ma X., Jiang T., Su B. (2020). Maximizing Temporal Correlations in Long-Term Global Satellite Soil Moisture Data Merging, *Remote Sens.*, 12 (13), 2164, **[4.848/4]**
17. **Kim S.**, Zhang R., Pham H., Sharma A. (2019). A review of satellite-derived soil moisture and its usage for flood estimation, *Remote Sens. Earth Syst. Sci.*, 2, 225–246, **[–/14]**
18. Pham H., **Kim S.**, Johnson F., Marshall L. (2019). Using 3D robust smoothing to fill land surface temperature gaps at the continental scale, *Int. J. Appl. Earth Obs. Geoinf.*, 82, 10879, **[5.933/10]**
19. **Kim S.**, Jun H. D., Yoo D. G., Kim J. H. (2019). A framework for improving reliability of water distribution systems based on a segment-based minimum cut-set approach, *Water*, 11(7), 1524, **[3.103/6]**
20. Zhang R., **Kim S.**, Sharma A. (2019). A comprehensive validation of the SMAP Enhanced Level-3 Soil Moisture product using ground measurements over varied climates and landscapes, *Remote Sens. Environ.*, 223, 82-94, **[10.164/48]**
21. **Kim S.**, Sharma A. (2019). The role of floodplain topography in deriving basin discharge using passive microwave remote sensing, *Water Resour. Res.*, 55(2), 1707-1716, **[5.240/12]**
22. Khan U., Ajami H., Tuteja N., Sharma A., **Kim S.** (2018). Catchment Scale Simulations of Soil Moisture Dynamics Using an Equivalent Cross-Section based Hydrological Modelling Approach, *J. Hydrol.*, 564, 944-966, **[5.722/15]**
23. **Kim S.**, Paik K., Johnson F., Sharma A. (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. Sel. Top. Appl. Earth Obs. Remote Sens.*, 11(2), 375-387, **[3.784/18]**
24. **Kim S.**, Balakrishnan K., Liu Y., Johnson F., Sharma A. (2017). Spatial Disaggregation of Coarse Soil Moisture Data by Using High Resolution Remotely Sensed Vegetation Products, *IEEE Geosci. Remote. Sens. Lett.*, 14(9), 1604-1608, **[3.966/15]**
25. **Kim S.**, Parinussa R., Liu Y., Johnson F., Sharma A. (2016). Merging Alternate Remotely-Sensed Soil Moisture Retrievals Using a Non-Static Model Combination Approach, *Remote Sens.*, 8 (6), 518, **[4.848/11]**
26. Silva A., Subasinghe K., Rajapaksha C., Raveenthiran K., **Kim S.,** Young M., Perera H. N. R., Araki S. (2016). Assessment of Design Alternation via 2D Physical Modelling in the Main Breakwater of Colombo Port Expansion Project. *J. Jpn. Soc. Civ. Eng., Ser. B2 (Coastal Engineering)*, 72(2), I_1129-I_1134, **[–/0]**
27. **Kim S.**, Parinussa R., Liu Y., Johnson F., Sharma A. (2015). A framework for combining multiple soil moisture retrievals based on maximizing temporal correlation, *Geophys. Res. Lett.*, 42 (16), 2015GL064981, **[4.720/34]**
28. **Kim S.**, Liu Y., Johnson F., Parinussa R., Sharma A. (2015). A global comparison of alternate AMSR2 soil moisture products: Why do they differ? *Remote Sens. Environ.*, 161 (0), 43-62, **[10.164/134]**
29. Jun H. D., **Kim S.**, Yoo D. G., Kim J. H. (2009). Evaluation of the reliability improvement of a water distribution system by changing pipe, *J. Korea Water Resour. Assoc.*, 42 (6), 505-511, **[–/5]**

❖ **Conference proceedings**

1. Young M., Hayman-Joyce J., **Kim S.** (2012). Use of Single Layer Concrete Armour Units as Toe Reinforcement, *Coast. Eng. Proc.*, 1 (33), 48, **[–/3]**

Presentations (selected)

1. **Kim S.**, Sharma A., Wasko C., Nathan R. How does total precipitable water link to precipitation extremes?, *MODSIM 2021*, Sydney, Australia
2. **Kim S.**, Zhang R., Sharma A., Lakshmi V. Improvements of satellite observations through data merging: status and challenges, *AGU fall meeting 2020*, San Francisco, CA, USA

3. **Kim S.**, Pham H., Liu Y., Sharma A., Marshall L. Combining geophysical variables for maximizing temporal correlation without reference data, *MODSIM 2019*, Canberra, Australia
4. **Kim S. [Invited]**, Guo Y., Wasko C., Sharma A. On soil moisture, rain and flood extremes in a warming climate – using satellite remote sensing to define future antecedent conditions, *KSCC 2018*, Jeju, Republic of Korea
5. **Kim S.**, Ajami H., Sharma A. Incorporating an operational satellite-derived leaf area index into a computationally efficient semi-distributed hydrologic modelling application (SMART), *MODSIM 2017*, Hobart, Australia
6. **Kim S.**, Liu Y., Johnson F., Sharma A. A temporal correlation-based approach for spatial disaggregation of remotely sensed soil moisture, *AGU fall meeting 2016*, San Francisco, CA, USA
7. **Kim S.**, Liu Y., Johnson F., Parinussa R., Sharma A. Reducing Structural Uncertainty in AMSR2 Soil Moisture Using a Model Combination Approach, *AGU fall meeting 2014*, San Francisco, CA, USA
8. **Kim S.**, Liu Y., Johnson F., Parinussa R., Sharma A. Improvement of Soil Moisture Dataset Combining AMSR2 Soil Moisture Products, *OzEWEX 2014*, Canberra, ACT, Australia

Awards & Grants

- **Early Career Research Excellence (ECRE) Award** || Modelling and Simulation Society of Australia and New Zealand Inc. (MSSANZ) || Dec 2021
- **UNSW Early Career Academic Seed grants** (AUD 1,000) || UNSW Sydney || 2021
- **UNSW Strategic Research Fund** (AUD 4,000) || UNSW Sydney || 2021
- **UNSW Postgraduate Writing Fellowship** (AUD 8,000) || UNSW Sydney || May 2017 – Aug 2017
- **Tuition Fee, Stipend and Top-up Scholarship ||** UNSW Sydney || Jul 2013 – Jan 2017
- **Scholarships from Admin Assistant, GS E&C and NRKF BK 21 ||** Korea University || 2006 – 2007

Certifications

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

Languages

Korean (mother tongue), English (fluent)

Skills & Expertise

Hydrology and water resources engineering, remote sensing, MATLAB, Python, ArcGIS/QGIS

Research Experiences

- **Research Associate ||** UNSW Sydney || Apr 2017 –
  - Validation, improvement, analysis, and (hydrological) application of remote sensing data
- **Ph.D. Student ||** UNSW Sydney || Jul 2013 – Mar 2017
  - Improvements and applications of satellite-derived soil moisture for flood forecasting
- **Master Student ||** Korea University || Mar 2006 – Feb 2008
  - Improving the reliability of water distribution system

Teaching Experiences

- **Post-Doctoral Teaching Assistant ||** UNSW Sydney || Jul 2017 – Mar 2020
  - Teaching, coordinating and consulting for *Catchment and Water Resources Modelling* (PG), *Water Resources Engineering* (UG)
  - Academic supervision of Higher Degree Research (1 student): paper #5, 6, and 11
  - Academic supervision of masters (course work)/honours (22 students): paper #7, 10, and 20
- **Teaching Assistant ||** UNSW Sydney || Jul 2013 – Mar 2017
- **Teaching Assistant ||** Korea University || Mar 2006 – Dec 2007

Professional activities

- **Reviewer for Scholarly Journal**: *Int. J. Appl. Earth Obs. Geoinf.*; *J. Hydrol.; Remote Sens. Environ.*; *Stoch Environ Res Risk Assess*; *PLOS ONE*; *KSCE J. Civ. Eng.; ISPRS J. Photogramm. Remote Sens.*; *Environ. Res. Lett.*; *ISPRS Int. J. Geo-Inf.*
- **Conference session convener**: AOGS 2020; MODSIM 2021
- **Editorial board**: MDPI Remote Sensing (topic editor and volunteer reviewer)
- **Professional membership**: Engineers Australia (EA), Australian Water Association (AWA), Korean Society of Remote Sensing (KSRS), Korea Water Resources Association (KWRA), Korean Society of Civil Engineers (KSCE)

Projects Involved

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

Referees

- **Prof. Ashish Sharma** (Ph.D. and current supervisor): School of Civil and Environmental Engineering, UNSW Sydney, Australia, a.sharma@unsw.edu.au
- **A/Prof. Fiona Johnson** (Ph.D. joint-supervisor): School of Civil and Environmental Engineering, UNSW Sydney, Sydney, Australia, f.johnson@unsw.edu.au
- **Dr. Yi Liu** (Ph.D. co-supervisor): School of Civil and Environmental Engineering, UNSW Sydney, Australia, yi.liu@unsw.edu.au
- **Dr. Raj Mehrotra** (senior researcher in group): School of Civil and Environmental Engineering, UNSW Sydney, Australia, raj.mehrotra@unsw.edu.au
- **Dr. Robert Parinussa** (former senior researcher in group): Cycling Sports Group/Cannondale, Amsterdam, North Holland, Netherlands, r_parinussa@hotmail.com