

Safran Khan

PhD Candidate, Civil and Environmental Engineering
Utah Water Research Laboratory | Utah State University | Logan, Utah
Email: safran.khan@usu.edu | Phone: (435) 512-3159 | [Google Scholar](#)

EDUCATION

- 2023 to Present PhD, Civil Engineering, Utah State University, Logan, Utah
Expected August 2027
- **Dissertation:** *Advancing Camera-Based Hydrologic Monitoring Using Artificial Intelligence and Computer Vision*
- 2021 to 2023 MS, Civil Engineering, Kyungpook National University, South Korea
- **Thesis:** *Crack Detection Using Efficient Nested Res-UNet with CBAM*
- 2016 to 2020 BS, Civil Engineering, University of Engineering & Technology, Pakistan
- **Thesis:** *Testing Fly Ash-Based Geopolymer Concrete as a Full Replacement for Ordinary Portland Cement Concrete*

RESEARCH INTERESTS

- Computer vision and deep learning for hydrologic monitoring
- Camera-based river stage, surface velocity, and discharge estimation
- Edge computing and autonomous environmental sensing
- Data-driven water resources monitoring and hydrologic modeling

PEER-REVIEWED JOURNAL PUBLICATIONS

4. Issa, R. B., Neupane, **S., Khan, S.**, Horsburgh, J. S., & Young, S. (2026). *Towards real-time water level and discharge measurements using imagery, machine learning, and edge computing*. Journal of Hydroinformatics. <https://doi.org/10.2166/hydro.2026.147>
3. **Khan, S.**, Jan, A., & Seo, K. (2025). *Accurate structural crack detection using NestedUNet from drone and handheld camera images*. KSCE Journal of Civil Engineering, 29(9), 100204. <https://doi.org/10.1016/j.kscej.2025.100204>
2. **Khan, S.**, Jan, A., & Seo, S. (2023). *Structural crack detection using deep learning: An in-depth review*. Korean Journal of Remote Sensing, 39(4), 371 to 393. <https://doi.org/10.7780/KJRS.2023.39.4.1>
1. Jan, A., **Khan, S.**, & Seo, S. (2023). *Deep learning-based depth map estimation: A review*. Korean Journal of Remote Sensing, 39(1), 1 to 21. <https://doi.org/10.7780/KJRS.2023.39.1.1>

MANUSCRIPTS UNDER REVIEW AND PREPRINTS

1. **Khan, S.**, Bin Issa, R., & Young, S. *Non-Contact River Surface Velocity and Discharge Estimation from Fixed Cameras Using Deep Optical Flow and Velocity Reconstruction*. Under review at *Water Resources Research*. Preprint: <https://doi.org/10.2139/ssrn.6431270>
2. Latif, A., **Khan, S.**, Hashemi, M., & Yost, M. (2026). *A review of image-based and AI-driven water level monitoring: Methods, datasets, and deployment considerations*. Manuscript under review at *Artificial Intelligence Review*.

CONFERENCE PRESENTATIONS

1. Issa, R., Young, S., Horsburgh, J. **S., Khan, S.**, & Neupane, S. Operationalizing camera-based hydrologic monitoring with AI and edge computing. ASABE Annual International Meeting, Toronto, Ontario, Canada, July 2025.
2. Young, S., Horsburgh, J. S., Goharian, E., **Khan, S.**, Issa, R., & Neupane, S. Advancing camera-based monitoring for operational water resource applications. ASCE EWRI Congress, Milwaukee, Wisconsin, May 2024.

CONFERENCE POSTERS

1. Goharian, E., Young, S., Horsburgh, J. S., Issa, R., **Khan, S.**, Neupane, S., & Hatami, M. Advancing camera-based monitoring for operational hydrologic applications. American Geophysical Union Annual Meeting, Washington, DC, December 2024.
2. Issa, R., **Khan, S.**, Young, S., Horsburgh, J. S., & Neupane, S. Advancing camera-based monitoring for hydrologic applications. Utah State University Spring Runoff Conference, Logan, Utah, March 2024.
3. **Khan, S.** Camera-based hydrological monitoring: Evaluating deep learning models for real-time river analysis. Utah State University Spring Runoff Conference, Logan, Utah, 2024.

RESEARCH EXPERIENCE

- | | |
|-----------------|--|
| 2023 to Present | Graduate Research Assistant, Utah Water Research Laboratory
Utah State University, Logan, Utah <ul style="list-style-type: none">• Develop camera-based systems for river stage, surface velocity, and discharge monitoring using computer vision, deep learning, and edge computing. |
| 2021 to 2023 | Graduate Research Assistant, Smart Construction Laboratory
Kyungpook National University, Daegu, South Korea <ul style="list-style-type: none">• Conducted computer vision research for structural crack detection, construction safety monitoring, and monocular depth estimation. |

TEACHING EXPERIENCE

- | | |
|--------------|---|
| Sep 2025 | Course Assistance, Utah State University
Logan, Utah <ul style="list-style-type: none">• Assisted with preparation of instructional materials for an advisor-led course.• Delivered a guest lecture related to research, led a coding activity, and designed a course assignment. |
| 2022 to 2023 | Teaching Assistant, Kyungpook National University
Daegu, South Korea <ul style="list-style-type: none">• Supported faculty course instruction during the second year of the MS program. |

- 2020 to 2021 Lecturer, Khyber Technical Education Academy
Kabul, Swat, Pakistan
- Delivered classroom instruction and supported student learning in technical education courses.

ACADEMIC SERVICE

- Peer reviewer, Engineering Applications of Artificial Intelligence, 4 reviews
- Peer reviewer, Journal of Hydroinformatics, 4 reviews
- Peer reviewer, Information Fusion, 2 reviews
- Peer reviewer, Water Resources Research, 1 review

AWARDS AND SCHOLARSHIPS

- 2021 to 2023 King Scholarship, Kyungpook National University
Full scholarship for MS studies

TECHNICAL EXPERTISE

- Programming and AI: Python, TensorFlow, PyTorch, MATLAB
- Computer Vision: image segmentation, object detection, classification, optical flow, depth estimation
- Hydrology and Modeling: HEC RAS, PFLOTRAN, ATS, QGIS
- Engineering Software: AutoCAD, SAP2000, Primavera P6, SketchUp
- Field and Sensing: drone imaging, fixed camera deployment, environmental sensor deployment.

PROFESSIONAL CREDENTIALS AND CERTIFICATIONS

- Registered Engineer, Pakistan Engineering Council, Civil 58326
- Registered Surveyor, South Korea

ADDITIONAL PROFESSIONAL EXPERIENCE

- 2020 Trainee Engineer, Saidu Sharif Construction
Swat, Pakistan
- Supported survey and construction workflows for road and bridge projects.

REFERENCES

Sierra N. Young, Ph.D.

Associate Professor, Civil and Environmental Engineering
Utah Water Research Laboratory, Utah State University
Email: sierra.young@usu.edu
Phone: 435 797 1519

Jeffery S. Horsburgh, Ph.D.

Professor, Civil and Environmental Engineering
Utah Water Research Laboratory, Utah State University
Email: jeff.horsburgh@usu.edu
Phone: 435 797 2946