SUNIL DUWAL

Curriculum Vitae

Khwopa College of Engineering
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Education

2020–present **PhD, Civil Engineering**, *Kathmandu University*, Dhulikhel.
Flood Modelling and Flood Plain Management using hydrodynamic and Machine Learning Approaches

2010–2011 : **Masters of Science, Hydrology, Hydrogeology and Water Resource(120 HECS)**, *Stockholm University*, Stockholm, Sweden.

2011 : **Extra Courses in MSc.(10 HECS)**, *Lund University*, Lund, Sweden, Introduction and advanced GIS (online course).

2010–2011 : **Extra Courses in MSc.(22.5 HECS)**, *Stockholm University*, Stockholm, Sweden, 1. Scientific writing in English, 2. Positioning, Map Projection, and Digital Photogrammetry, 3. Remote Sensing and Digital Image Processing.

2003–2008 : **Bachelor of Engineering, Civil Engineering**, *Khwopa Engineering College*, Bhaktapur.

Research Interest

Machine Learning/AI, Disaster Management, Water Resource Management, Flood, Hydrology

Publications

Journal Articles

2024 S. O. Mangkhaseum, Y. Bhattarai, **S. Duwal**, and A. Hanazawa. Flood susceptibility mapping leveraging open-source remote-sensing data and machine learning approaches in Nam Ngum River Basin (NNRB), Lao PDR. *Geomatics, Natural Hazards and Risk*, volume 15, page 2357650. Taylor & Francis, 2024.

2024 Y. Bhattarai, **S. Duwal**, S. Sharma, and R. Talchabhadel. Leveraging machine learning and open-source spatial datasets to enhance flood susceptibility mapping in transboundary river basin. *International Journal of Digital Earth*, volume 17, page 2313857. Taylor & Francis, 2024.

2024 Y. Bhattarai, S. Bista, R. Talchabhadel, **S. Duwal**, and S. Sharma. Rapid prediction of urban flooding at street-scale using physics-informed machine learning-based surrogate modeling. *Total Environment Advances*, volume 12, page 200116, 2024.

2023 **S. Duwal**, D. Liu, and P. M. Pradhan. Flood susceptibility modeling of the karnali river basin of nepal using different machine learning approaches. *Geomatics, Natural Hazards and Risk*, volume 14. Taylor & Francis, 12 2023.

2023 **S. Duwal**, Y. Bhattarai, R. Milapati, and R. Talchabhadel. Charting the course to resilience: Hydrodynamic modeling for socio-economic insights for flood risk management in Nepal's ungauged Roshi River Catchment. *Journal of Hydrology and Meteorology*, volume 11, pages 53–66, 2023.

2021 M. Shakya, C.K. Kawan, A.K. Gaire, and **S. Duwal**. Post-earthquake damage assessment of traditional masonry buildings: A case study of Bhaktapur municipality following 2015 Gorkha (Nepal) earthquake. *Engineering Failure Analysis*, volume 123. Elsevier, 2021.

2017 S. Shrestha, M. Reina Ortiz, M. Gutland, R. Napolitano, I. M. Morris, M. Santana Quintero, J. Erochko, S. Kawan, R. G. Shrestha, P. Awal, S. Suwal, **S. Duwal**, and D. K. Maharjan. Digital recording and noon-destructive techniques for the understanding of structural performance for rehabilitating historic structures at the Kathmandu Valley after Gorkha Earthquake 2015. *ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, volume 4, 2017.

In Conference Proceedings

2024 S.O. Mangkhaseum, **S. Duwal**, Y. Bhattarai, and A. Hanazawa. Harnessing multisatellite remote sensing data and machine learning for flood risk assessment in Nam Ngum River Basin, Lao PDR. In *SPIE Future Sensing Technologies*, 2024.

2024 S.O. Mangkhaseum, Y. Bhattarai, **S. Duwal**, and A. Hanazawa. Flood susceptibility mapping using publicly available big data with Google Earth Engine and deep learning algorithms. In *The 5th International Conference on Big Data Analytics and Practices 2024 (IBDAP 2024)*, 2024.

2023 **S. Duwal**, P. M. Pradhan, Y. Bhattarai, and D. Liu. Machine learning for flood susceptibility mapping and assessment of associated risk to the population and buildings in the Karnali River Basin. In *International Conference on Technologies for Computer, Electrical and Electronics and Communications (ICTCEEL2023)*, 2023.

2023 Y. Bhattarai and **S. Duwal**. Application of the machine learning in management of flood hazard in transboundary river. In *International Conference on Water and Flood Management-ICWFM 2023*, volume 95, pages 194–195, 2023.

2018 R. Joshi, **S. Duwal**, and S. Duwal. Making Bhaktapur a rain-efficient city. In *International Conference in Water, Environment and Climate Change, Knowledge Sharing and Partnership*, 2018.

2016 M. Shakya, **S. Duwal**, and C. K. Kawan. Rapid visual damage assessment of masonry buildings after 2015 Gorkha Earthquake: A case study of Bhaktapur Municipality. In *International conference on earthquake engineering and post-disaster reconstruction planning*, pages 202–211, 2016.

2016 K. Gnyawali, S. Maka, B.R. Adhikari, D. Chamlagain, and A. R. Dhungana **S. Duwal**. Spatial implications of earthquake induced landslides triggered by the April 25 Gorkha Earthquake Mw 7.8: Preliminary analysis and findings. In *International conference on earthquake engineering and post-disaster reconstruction planning*, 2016.

Teaching Subjects

Engineering Hydrology, GIS and Remote Sensing, Computational Techniques in Civil Engineering, Engineering Economics for Bachelor Level in Engineering.

Computer-Aided Design, Environmental Modeling for Masters level.

Masters Thesis Supervision

2024 Assessment of Liquefaction Potential of Kathmandu Valley Using Different Machine Learning Approaches, Bikesh Tamrakar

2024 Machine Learning Techniques for Estimating Seismic Site Characterization Parameter: Vs30 in the Kathmandu Basin, Sachin Pokharel

2023 Groundwater Pollution Vulnerability map Using DRASTIC Approach of Bhaktapur, Nepal, Neha Sah

2022 Flood Hazard Mapping of Roshi Khola, Kavre, Rabina Milapati

2016 Landuse and Land Cover Change Analysis in Kathmandu Valley, Nisham Maharjan

Grants-Awards

2020 –present ***University Grants Commission (UGC), Nepal, PhD Research Grant*** as a PhD research scholar at Kathmandu University.

Skills

Programming Languages	Python, MATLAB, R
GIS & RS	QGIS, ArcGIS, Google Earth Engine
Hydrology & hydraulic modeling	HEC-RAS, HEC-HMS
Machine Learning & AI	Machine Learning for classification and regression modeling with ANN, RNN, SVM, RF, etc.
Environmental Modeling	ISEE systems STELLA for System Dynamics

Job Experience

2016–Present	**Principal & Associate Professor**, Khwopa College of Engineering.
2014-2016	**Vice-Principal**, Khwopa College of Engineering.
2013	**Lecturer**, Khwopa Engineering College.
2012	**Part-time faculty**, Khwopa College of Engineering & Khwopa Engineering College.

Teaching Assistant

2008 :	**Surveying, Water Supply, Transportation Engineering and Sanitary Engineering**, Nepal Engineering College.

Professional Job

2007–2008:	**Civil Engineer**, Aviyaan Consulting Private Limited.

Professional Memberships

2008-present:	**General Member**, Nepal Engineering Council.
2014-present:	**General Member**, Nepal Engineering Association.
2023-present:	**Individual Member**, South Asia Alliance of Disaster Research Institutes.