

SUNIL DUWAL

Curriculum Vitae

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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. Talchabadel. 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. Talchabadel, **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. Talchabadel. 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 non-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
- 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.
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Professional Job

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