Arjun Dahal

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Education

PhD in Computer Science — *University of Texas at Arlington*
Fully Funded, Advisor: Dr. Yu Lei — *Aug 2022 – Present*

Bachelor's in Electronics and Communication Engineering — *IOE, Tribhuvan University*
Ranked in top 100 of 12,000 entrants, Full Scholarship — *2014 – 2018*
Thesis: Nepali Speech Recognition using RNN-CTC Model

Experience

Graduate Teaching Assistant — *Arlington, TX*
University of Texas at Arlington — *Aug 2022 – Present*

- Working on Fairness Testing of Black Box Models by generating natural test cases for the tabular domain.
- Teaching Assistant for courses related to Programming, Software Development, and Software Testing.

Solutions Engineer — *Lalitpur, Nepal*
LogPoint — *2018 – 2022*

- Solved issues related to Software, System, and Network on the production environment.
- Led the deployment, migration, and monitoring of the solutions (SIEM and SOAR) on the customer's premises or cloud by collaborating with multiple stakeholders.

Publications

Dahal, A., Lei, Y., Kacker, R. N., & Kuhn, D. R. (2025). TabChange: An Approach to Natural Changes in Tabular Data. Under Review.

Dahal, A., Shree, S., Lei, Y., Kacker, R. N., & Kuhn, D. R. (2025). Fairness Testing of Machine Learning Models Using Combinatorial Testing in Latent Space. *In Proceedings of the 2025 IEEE International Conference on Software Testing, Verification and Validation Workshops (ICSTW)*. IEEE.

Regmi, P., ***Dahal, A.***, & Joshi, B. (2019). Nepali Speech Recognition Using RNN-CTC Model. *International Journal of Computer Applications*, *178*(31), 1–6.

Research Projects

Generation of Natural Test Cases for Fairness Testing — *2025 - Ongoing*

- Implemented an autoencoder with an adversarial component to make appropriate changes to the attributes of a tabular instance. The modified instances are natural and more proximal to the original instances, resulting in True Positive test cases in 8 out of 11 cases across 7 datasets compared to the State of the art.

Fairness Testing using Combinatorial Testing in Latent Space — *2024 - 2025*

- Applied Combinatorial Testing in the latent space of a Variational Autoencoder to efficiently generate natural test cases (improvement of 43% in naturalness over the baseline) for testing the fairness of black box models.

Nepali Speech Recognition — *2018 - 2019*

- Applied a Recurrent Neural Network along with Connectionist Temporal Classification (CTC) loss for end-to-end Nepali language recognition.

Skills

Programming: Python, C; Frameworks and Libraries: PyTorch, Scikit-learn, Numpy, Matplotlib

Troubleshooting: System, Network, and Software debugging and troubleshooting

Leadership: Mentored new hires and led biweekly interdepartmental knowledge transfer sessions at Logpoint, IT Coordinator at Nepalese Student Association, University of Texas at Arlington (NSA-UTA)