Jwala Dhamala
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Research interests
Deep learning, Machine learning, Natural language understanding, Fair, interpretable and robust models, Healthcare applications.

Education
Ph.D. in Computing and Information Sciences 2014 - 2020
Rochester Institute of Technology, Rochester, NY, US GPA: 3.93/4.00
Advisor: Dr. Linwei Wang

B.E. in Computer Engineering 2008 - 2012
Pulchowk Campus, Tribhuvan University, Nepal with Distinction

Experience
Applied Scientist 2019 - Present
Alexa AI - Natural Language Understanding
Cambridge, MA, US

Research Assistant 2014 - 2019
Computational Biomedicine Lab
Rochester Institute of Technology, NY, US
Research focus: Machine/deep learning approaches to integrate measurements with physics-based simulations for probabilistic personalization of the simulation models. Experience with machine learning methods like Gaussian processes, Bayesian optimization and MCMC; and deep learning methods like variational auto-encoders (VAE) and geometric deep learning.

Research Intern 2018
Philips Healthcare, Cambridge, MA, US
Research focus: Unsupervised representation learning and similarity assessment of multi-variate time-series physiological signals. Experience with RNNs, LSTMs and approximate nearest neighbor methods.

Software Engineer 2012 – 2014
Business Intelligence Department
Logic Information Systems, Nepal
Focus: Worked and lead projects on ETL for data warehousing and statistical data analysis for business intelligence dashboards. Designed and conducted training sessions for interns.

Research Intern 2012
Business Intelligence Department
Logic Information Systems, Nepal
Research Focus: Data mining and data visualization. Experience with clustering, market basket analysis and multilayered perception.

Journal articles
Fast Posterior Estimation of Cardiac Electrophysiological Model Parameters via Bayesian Active Learning
M. Zaman, J. Dhamala, P. Bajracharya, H. J. Arevalo, J. Sapp, M. Horáček, K. C. Wu, N. A. Trayanova & L. Wang
Medical Image Analysis (MedIA), 2020, invited

Embedding High-dimensional Bayesian Optimization via Generative Modeling: Parameter Personalization of Cardiac Electrophysiological Models
J. Dhamala, H. J. Arevalo, J. Sapp, M. Horáček, K. C. Wu, N. A. Trayanova & L. Wang
Medical Image Analysis (MedIA), 2020, invited

Quantifying the Uncertainty in Model Parameters using Gaussian Process-based
Markov Chain Monte Carlo in Cardiac Electrophysiology
J. Dhamala, H. J. Arevalo, J. Sapp, M. Horáček, K. C. Wu, N. A. Trayanova & L. Wang
Medical Image Analysis (MedIA), 2018

Multivariate Time-series Similarity Assessment via Unsupervised Representation Learning and Stratified Locality Sensitive Hashing: Application to Early Acute Hypotensive Episode Detection
J. Dhamala, E. Azuh, A. Al-Dujaili, J. Rubin & U. M. O'Reilly
IEEE Sensors Letters, 2018

Spatially Adaptive Multi-scale Optimization for Local Parameter Estimation in Cardiacelectrophysiology
J. Dhamala, H. J. Arevalo, J. Sapp, M. Horáček, K. C. Wu, N. A. Trayanova & L. Wang
IEEE Transactions on Medical Imaging (IEEE TMI), 2017

On the Intrinsic and Extrinsic Fairness Evaluation Metrics for Contextualized Language Representations
Y. Trista Cao, Y. Pruksachatkun, K. Chang, R. Gupta, V. Kumar, J. Dhamala, A. Galstyan
Association for Computational Linguistics (ACL), 2022

Mitigating Gender Bias in Distilled Language Models via Counterfactual Role Reversal
U. Gupta, J. Dhamala, V. Kumar, A. Verma, Y. Pruksachatkun, S. Krishna, R. Gupta, K. Chang, G. Steeg & A. Galstyan
Association for Computational Linguistics (ACL findings), 2022

Measuring Fairness of Text Classifiers via Prediction Sensitivity
S. Krishna, R. Gupta, A. Verma, J. Dhamala, Y. Pruksachatkun & K. Chang
Association for Computational Linguistics (ACL), 2022

Does Robustness Improve Fairness? Approaching Fairness with Word Substitution Robustness Methods for Text Classification
Y. Pruksachatkun, S. Krishna, J. Dhamala, R. Gupta & K. Chang
North American Chapter of the Association for Computational Linguistics (NAACL findings), 2021

BOLD: Dataset and Metrics for Measuring Biases in Open-Ended Language Generation
J. Dhamala*, T. Sun*, V. Kumar, S. Krishna, Y. Pruksachatkun, K. Chang & R. Gupta
ACM Conference on Fairness, Accountability, and Transparency (ACM FAccT), 2021

Learning Geometry-Dependent and Physics-Based Inverse Image Reconstruction
X. Jiang, S. Ghimire, J. Dhamala, Z. Li, P. K. Gyawali & L. Wang
Medical Image Computing and Computer-Assisted Intervention (MICCAI), 2020

Bayesian Optimization on Large Graphs via a Graph Convolutional Generative Model: Application in Cardiac Model Personalization
J. Dhamala, S. Ghimire, J. L. Sapp, B. M. Horáček & L. Wang
Medical Image Computing and Computer-Assisted Intervention (MICCAI), 2019

Improving Generalization of Deep Networks for Inverse Reconstruction of Image Sequences
S. Ghimire, P. K. Gyawali, J. Dhamala, J. L. Sapp, J. L., Horáček, M., and Wang, L.
Information Processing in Medical Imaging (IPMI), 2019

High-dimensional Bayesian Optimization of Personalized Cardiac Model Parameters via an Embedded Generative Model
J. Dhamala, S. Ghimire, J. L. Sapp, B. M. Horáček & L. Wang
Medical Image Computing and Computer-Assisted Intervention (MICCAI), 2018

Generative Modeling and Inverse Imaging of Cardiac Transmembrane Potential
S. Ghimire, J. Dhamala, P. K. Gyawali, J. L. Sapp, B. M. Horáček & L. Wang
Medical Image Computing and Computer-Assisted Intervention (MICCAI), 2018

Quantifying the Uncertainty in Model Parameters using Gaussian Process-based
Markov Chain Monte Carlo: an Application to Cardiac Electrophysiological Models
J. Dhamala, J. L. Sapp, B. M. Horáček & L. Wang
Information Processing in Medical Imaging (IPMI), 2017
acceptance rate ~ 30%

Overcoming Barriers to Quantification and Comparison of Electrocardiographic
Imaging Methods: a Community-based Approach
S. Ghimire, J. Dhamala, J. Coll-Font, J. D. Tate, M. S. Guillem, D. H. Brooks, R. S.
MacLeod & L. Wang
Computing in Cardiology (CinC), 2017

The Consortium for Electrocardiographic Imaging
J. Coll-Font, J. Dhamala, D. Potyagaylo, W. H. Schulze, J. D. Tate, M. S. Guillem, P. Van
Dam, O. Dossel, D. H. Brooks & R. S. MacLeod
Computing in Cardiology (CinC), 2016

Spatially-adaptive Multi-scale Optimization for Local Parameter Estimation: Ap-
plication in Cardiac Electrophysiological Models
J. Dhamala, J. L. Sapp, B. M. Horáček & L. Wang
Medical Image Computing and Computer-Assisted Intervention (MICCAI), 2016
early acceptance, selection rate ~ 10%

Technical skills
Languages: Python, MATLAB
Deep Learning Framework: PyTorch
Misc: Bash scripting, \LaTeX typesetting, Git
Basic familiarity: R, Java, C, C++, HTML, PHP, MySQL

Workshop articles
Evaluating the Effectiveness of Efficient Neural Architecture Search for Sentence-
Pair Tasks
A. MacLaughlin, J. Dhamala, A. Kumar, S. Venkatapathy, R. Venkatesan & R. Gupta
Workshop on Insights from Negative Results in NLP, EMNLP, 2021

High-dimensional Bayesian Optimization of Personalized Cardiac Model Param-
eters via an Embedded Generative Model
J. Dhamala, S. Ghimire, J. L. Sapp, B. M. Horáček & L. Wang
Women in Machine Learning (WiML), 2018

Multivariate Time-series Similarity Assessment via Unsupervised Representation
Learning and Stratified Locality Sensitive Hashing: Application to Early Acute
Hypotensive Episode Detection
J. Dhamala, E. Azuh, A. Al-Dujaili, J. Rubin, and U. M. O’Reilly.
NeurIPS Machine Learning in Healthcare (NeurIPS MLAH), 2018

Scholarships & awards
Travel Grant, NeurIPS Machine learning for Health Workshop (MLAHI) 2018
Travel Grant, Woman in Machine Learning (WiML) 2018
Travel Grant, MICCAI 2016, 2018
IPMI Scholarship for Junior Scientists, IPMI 2017
GCCIS Student Grant, Rochester Institute of Technology 2017
Graduate Student Travel Award, Rochester Institute of Technology 2015
Women in Engineering Scholarship, University Grants Commission, Nepal 2010-2011
The College Fellowship Scholarship, Granted 8/8 semesters based on academic merit, Tribhuvan University 2008-2012
Golden Jubilee Scholarship, Government of India 2008-2012
Full-tuition waiver, Based on the performance on a countrywide
university entrance examination, Institute of Engineering,
Tribhuvan University 2008-2012
Mahatma Gandhi Scholarship, Government of India 2006-2007

Professional activities

Reviewing
Conference: ACL ARR 2021-present
Conference: NeurIPS 2021
Journal: Data Mining and Knowledge Discovery (Springer) 2021
Journal: Engineering Applications of Artificial Intelligence (Elsevier) 2021
Conference: MICCAI 2017-2021
Workshop: Woman in Machine Learning (WiML) 2018
Journal: IEEE Sensors Letters 2018
Journal: Journal of Biomedical and Health Informatics 2018
Journal: Engineering Applications of Artificial Intelligence 2021

Organization
TrustNLP: Workshop on Trustworthy Natural Language Processing 2021, 2022
North American Chapter of the Association for Computational Linguistics (NAACL)

Workshop on Measures and Best Practices for Responsible AI 2021
ACM SIGKDD Conference on Knowledge Discovery and Data Mining

Pre-orientation program
Woman in Computing, Rochester Institute of Technology 2017

Workshop on Premature Ventricular Contractions Localization 2016, 2017
Computing in Cardiology, Consortium of Electrocardiographic Imaging

LOCUS - Technological Festival 2012
Institute of Engineering, Pulchowk Campus

Invited talks
Fairness in Open-ended Language Generation
Workshop on Women in Science: Status, Challenges, Opportunities and Innovations, 2021
NEGAAS, Kathmandu, (Online Event)

Applications of Artificial Intelligence for Social Good
Women in Data Science (WiDS), 2021
Kathmandu, Nepal (Online Event)

Applications of Deep Learning to Multi-scale Physics-based Simulators
National Workshop on Machine Learning and Data Science, 2020
Kathmandu, Nepal (Online Event)

Model Personalization and Uncertainty Quantification in Cardiac Electrophysiological Models
Ph.D. Colloquium Series, 2018
College of Computing and Information Sciences, Rochester Institute of Technology
Rochester, NY, US

Personalization and Uncertainty Quantification in Cardiac Electrophysiological Models
Signal Processing Imaging Reasoning and Learning (SPIRAL) Seminar, 2018
Northeastern University, Boston, MA, US