

Jwala Dhamala

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Research Interests	Deep learning, Machine learning, Natural language understanding, Generative models, 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	Research 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	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 <i>Medical Image Analysis (MedIA)</i> , 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 <i>Medical Image Analysis (MedIA)</i> , 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 Cardiac Electrophysiology

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

Conference Articles

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
early acceptance (selection rate $\sim 15\%$), finalist for young scientist award

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
oral presentation

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
oral presentation, finalist for young scientist award (selection rate $\sim 1\%$)

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 $\sim 30\%$

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: Application 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 \sim 10%

Technical Skills	Languages: Python, MATLAB Deep Learning Framework: PyTorch Misc: Bash scripting, L ^A T _E X 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 <i>Workshop on Insights from Negative Results in NLP, EMNLP, 2021</i> 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 <i>Women in Machine Learning (WiML), 2018</i> 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. <i>NeurIPS Machine Learning in Healthcare (NeurIPS ML4H), 2018</i>	
Scholarships & awards	Travel Grant , NeurIPS Machine learning for Health Workshop (ML4H) Travel Grant , Woman in Machine Learning (WiML) Travel Grant , MICCAI IPMI Scholarship for Junior Scientists , IPMI GCCIS Student Grant , Rochester Institute of Technology Graduate Student Travel Award , Rochester Institute of Technology Women in Engineering Scholarship , University Grants Commission, Nepal The College Fellowship Scholarship , Granted 8/8 semesters based on academic merit, Tribhuvan University Golden Jubilee Scholarship , Government of India Full-tuition waiver , Based on the performance on a countrywide university entrance examination, Institute of Engineering, Tribhuvan University Mahatma Gandhi Scholarship , Government of India	2018 2018 2016, 2018 2017 2017 2015 2010-2011 2008-2012 2008-2012 2008-2012 2006-2007
Professional activities	Reviewing Conference: MICCAI Workshop: Woman in Machine Learning (WiML) Journal: IEEE Sensors Letters Journal: Journal of Biomedical and Health Informatics Journal: Engineering Applications of Artificial Intelligence Organization Workshop on Measures and Best Practices for Responsible AI ACM SIGKDD Conference on Knowledge Discovery and Data Mining TrustNLP: Workshop on Trustworthy Natural Language Processing North American Chapter of the Association for Computational Linguistics (NAACL) Pre-orientation program Woman in Computing, Rochester Institute of Technology Workshop on Premature Ventricular Contractions Localization Computing in Cardiology, Consortium of Electrocardiographic Imaging LOCUS - Technological Festival Institute of Engineering, Pulchowk Campus	2017-2021 2018 2018 2018 2021 2021 2021 2017 2016, 2017 2012

Invited talks

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