Meet P. Vadera

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meetvadera.github.io

Education

2017–2022 **University of Massachusetts Amherst**, M.S. & Ph.D. (Computer Science), GPA: 4.0/4.0

2012–2016 **Indian Institute of Technology (IIT) Gandhinagar**, B.Tech. (Mechanical Engineering, minor in Computer Science and Engineering), GPA: 8.29/10

Work Experience

Sept '22–Present **Amazon - Alexa Smart Home**, **Applied Scientist**

- Building deep learning models that leverage multi-modal data streams from Alexa Smart Home devices to improve the performance of Alexa Hunches and Intelligent Control actions.
- Performing research on building novel large language models to help Alexa generalize better and deliver exceptional customer experience.

Jun '21–Aug '21 **Amazon - Alexa Smart Home**, **Applied Scientist Intern**

- Worked on developing uncertainty quantification based machine learning systems for activity recognition in the context of smart home.
- Leveraged implicit user feedback to personalize and improve smart home intelligent control.

Jun '20–Sept '20 **IBM Research (MIT-IBM Watson AI Lab)**, **Research Intern**

- Worked on loss-calibrated inference for Bayesian neural networks. The goal of the project was to improve decision-making on downstream tasks by correcting posterior distribution using decision-utility functions.
- Published a paper on the project at UAI '21, and filed a patent related to the invention.

Jun '18–Aug '18 **Kronos Inc.**, **Data Science Intern**

- Developed deep learning models to predict late-edit risk in time cards. This leads to significant time saving for managers involved in the time-keeping task due to automated sorting of high-edit-risk time cards.
- Worked on an independent R&D project to develop neural network based models for volume forecaster at parity with existing production models.

June '16–July '17 **Innovaccer Inc.**, **Member of Technical Staff**

- Designed the software architecture, and developed modules of Data Quality Tool and Healthcare measures computation as core modules for the company's platform.

Publications

- **Vadera M.** Approximate Bayesian Deep Learning for Resource-Constrained Environments. *Doctoral Dissertation (2022)*
- **Vadera M.**, Samplawski C., and Marlin B. URSABench: Comprehensive Benchmarking of Approximate Bayesian Inference Methods for Deep Neural Networks. In the *ECCV Workshop on Uncertainty in Computer Vision (2022)*
- **Vadera M.**, Cobb A., Li, J., Jalaian B., Abdelzaher T., and Marlin B. URSABench: Comprehensive Benchmarking of Approximate Bayesian Inference Methods for Deep Neural Networks. In the *Fifth Conference on Machine Learning and Systems (2022)*
- **Vadera, M.**, and Marlin, B. Challenges and Opportunities in Approximate Bayesian Deep Learning for Intelligent IoT Systems. In the *IEEE Third International Conference on Cognitive Machine Intelligence (CogMI) (2021)*
- **Vadera M.**, Ghosh S., Ng K., and Marlin, B. Post-hoc loss-calibration for Bayesian neural networks. In the *37^{th} Conference on Uncertainty in Artificial Intelligence (2021)*
- Marlin, B., Abdelzaher, T., Ciocarlie, G., Cobb, A.D., Dennison, M., Jalaian, B., Kaplan, L., Raber, T., Raglin, A., Sharma, P.K. and Srivastava, M., Trout T., **Vadera M.**, Wigness, M. On Uncertainty and Robustness in Large-Scale Intelligent Data Fusion Systems. In the *IEEE Second International Conference on Cognitive Machine Intelligence (CogMI) (2020)*
- **Vadera M.**, Jalaian B., and Marlin, B. Generalized Bayesian Posterior Expectation

Distillation for Deep Neural Networks. In the *36th Conference on Uncertainty in Artificial Intelligence (2020)*

- **Vadera M.**, Cobb A., Jalaian B., and Marlin B. URSABench: Comprehensive Benchmarking of Approximate Bayesian Inference Methods for Deep Neural Networks. In the *ICML Workshop on Uncertainty & Robustness in Deep Learning (2020)*
- **Vadera M.**, Shukla S., Jalaian B., and Marlin B. Assessing the Adversarial Robustness of Monte Carlo and Distillation Methods for Deep Bayesian Neural Network Classification. In the *AAAI Workshop on Artificial Intelligence Safety (SafeAI) (2020)*
- **Vadera M.**, and Marlin, B. Investigating Fusion-Based Deep Learning Architectures for Smoking Puff Detection. In the *Fourth IEEE ACM Conference on Connected Health: Applications, Systems and Engineering Technologies (2019)* (Poster Paper)
- Holtsclaw C., **Vadera M.**, and Marlin, B. Towards Joint Segmentation and Active Learning for Block-Structured Data Streams. In *KDD Workshop on Data Collection, Curation, and Labeling (DCCL) for Mining and Learning (2019)* (Best Paper Award)
- **Vadera M.**, and Marlin, B. Assessing the Robustness of Bayesian Dark Knowledge to Posterior Uncertainty. In *ICML Workshop on Uncertainty & Robustness in Deep Learning (2019)*
- Singh, G., **Vadera, M.**, Samavedham, L., and Lim, E. C. H.. Multi-Class Diagnosis of Neurodegenerative Diseases: A Neuroimaging Machine Learning based Approach. In the *ACS Journal of Industrial & Engineering Chemistry Research (2019)*.
- Singh, G., **Vadera, M.**, Samavedham, L., Lim, E.C.H.. Machine Learning Based Framework for Multi-Class Diagnosis of Neurodegenerative Disease: A Study on Parkinson Disease. In the *11th IFAC Symposium on Dynamics and Control of Process Systems, including Biosystems (2016)*.

Patent Applications

- **Meet Prakash Vadera**, Uri Kartoun, Soumya Ghosh, Kenney Ng. POST-HOC LOSS-CALIBRATION FOR BAYESIAN NEURAL NETWORKS. Date filed: 05/11/2021, Publication date: 12/22/2022.
- Hongyang Wang, Amir Salimi, Sara Hillenmeyer, **Meet Prakash Vadera**, Sunny Singh, Arpit Jain, Chandra Prakash Konkimalla, Yishuai Li, Marc Wetter, William Welbourne, Charles Brett, George Strajan, Rajesh Bangaru Ravindranath, Siyuan Liu. DEVICE CONTROL USING NEAR REAL TIME MODELING. Date filed: 03/28/2022.

Awards

- Best paper award at KDD '19 Workshop on Data Collection, Curation, and Labeling (DCCL) for Mining and Learning.
- NSF travel award to attend IEEE/ACM CHASE '19.
- Top reviewer for UAI '23, UAI '22 and NeurIPS '22.

Teaching

- Teaching Assistant for COMPSCI 326: Web Programming (Fall 2017), a beginner's course on full-stack web development using Python, targeted for junior and senior year students at the University of Massachusetts Amherst.
- Teaching Assistant for ES102: Computing (Fall 2015), a basic programming course for freshmen at IIT Gandhinagar.

Service to the Profession

- Served as a reviewer for the following top-tier conferences and journals:
  - **Conferences:** UAI '21, ICML '22, UAI '22, NeurIPS '22, MLSys '23, UAI '23, FAccT '23, NeurIPS '23, ACM MultiMedia '23, ICCV Workshop on Uncertainty in Computer Vision '23.
  - **Journals:** Journal of Machine Learning Research, IEEE Transactions on Multimedia, and Elsevier Journal on Signal Processing: Image Communication.

Technical Skills

Python, Scala, C, MATLAB, R, PyTorch, Tensorflow, HuggingFace Transformers, Keras, Weka, Apache Spark, MySQL, Elasticsearch, MongoDB