Ronak Mehta

203-969-5613
ronakrm@cs.wisc.edu
ronakrm.github.io

Education

University of Wisconsin-Madison *Madison, WI*
Computer Sciences, PhD *2016 - 2022*
Minor in Statistics
Computer Sciences, MS *2014 - 2016*

- Advisors: Vikas Singh and Michael Newton
- Research in Machine Learning and Computer Vision
- Thesis Topic: Identifying Feature, Parameter, and Sample Subsets in Machine Learning and Image Analysis
- Relevant Coursework: Artificial Intelligence, Machine Learning, Computer Vision, Statistical Inference, Linear and Nonlinear Optimization, Graphical Models, Stochastic Processes, Computational Statistics

University of Michigan-Ann Arbor *Ann Arbor, MI*
Computer Engineering, B.S.E. *2010 - 2014*

- Selected Coursework: Autonomous Robotics, Design of Microprocessor-based Systems, Embedded Control Systems, Design and Manufacturing, Control Systems Analysis and Design

Experience

Redwood Research *Berkeley, CA*
REMIX Research Resident *January 2023*

- Participated in a month-long coordinated research program on mechanistic interpretability of transformers towards understanding large-language models.
- Worked on grounding topical mechanistic interpretability methods in theoretical foundations common in mainstream machine learning research, connecting ideas in interpretability hypothesis testing to classical probabilistic measures of conditional independence.

Computer Sciences Department, UW-Madison *Madison, WI*
Graduate Research Assistant *2015-2022*

- Collaborated on machine learning and computer vision research projects, with applications in modeling preclinical development of Alzheimer's disease with the Wisconsin Alzheimer's Disease Research Center.
- Research focuses on problems of Selection in Machine Learning: Which features, samples, or models are minimally sufficient or important based on a specified measure of interest (accuracy, fairness, model size, etc.)?

American Family Insurance *Madison, WI*
Enterprise: Machine Learning Intern *2021 - 2022*

- Created a fairness toolbox for understanding and accounting for unfairness and bias in large datasets and machine learning models.
- Developed new methods for fairness regularization via high-dimensional Earth Mover's Distance formulations, concluding in ICLR conference publication.

Continental Automotive Systems *Deer Park, IL*
Business Unit Transmission: Embedded Software Engineering Intern *2013*

- Developed an application to systematically test multiple features of a transmission control module in parallel asynchronously using NI LabView and NI bench-testing hardware.
- Identified known bugs from previous software releases through extended test runs.
- Gained extensive knowledge of automated testing and embedded software systems.

Publications

Efficient Discrete Multi Marginal Optimal Transport Regularization.
ICLR 2023. **(top 25%)** *Ronak Mehta, Jeffery Kline, Vishnu Suresh Lokhande, Glenn Fung, Vikas Singh.*

Deep Unlearning via Randomized Conditionally Independent Hessians.
CVPR 2022. *Ronak Mehta, Sourav Pal, Vikas Singh, Sathya Ravi.*

Investigating Functional Brain Network Abnormalities via Differential Covariance Trajectory Analysis and Scan Statistics.
ISBI 2022. *Anita Sinha, Ronak Mehta, Veena Nair, Rasmus Birn, Vikas Singh, Vivek Prabhakaran.*

Graph Reparameterizations for Enabling 1000+ Monte Carlo Iterations in Bayesian Deep Neural Networks.
UAI 2021. *Yuri Nazarov, Ronak Mehta, Vishnu Lokhande, Vikas Singh.*

Scaling Recurrent Models via Orthogonal Approximations in Tensor Trains
ICCV 2019. *Ronak Mehta, Rudrasis Chakraborty, Yunyang Xiong, Vikas Singh.*

Resource Constrained Neural Network Architecture Search: Will a Submodularity Assumption Help?
ICCV 2019. *Yunyang Xiong, Ronak Mehta, Vikas Singh.*

DUAL-GLOW: Conditional Flow-Based Generative Model for Modality Transfer.
ICCV 2019. *Haoliang Sun, Ronak Mehta, Hao H. Zhou, Zhichun Huang, Sterling C. Johnson, Vivek Prabhakaran, Vikas Singh*

Sampling-free Uncertainty Estimation in Gated Recurrent Units with Applications to Normative Modeling in Neuroimaging
UAI 2019. *Seong Jae Hwang, Ronak Mehta, Hyunwoo J. Kim, Sterling C. Johnson, Vikas Singh.*

On Training Deep 3D CNN Models with Dependent Samples in Neuroimaging
IPMI 2019. *Yunyang Xiong, Hyunwoo J. Kim, Bhargav Tangirala, Ronak Mehta, Sterling C. Johnson, Vikas Singh.*

Finding Differentially Covarying Needles in a Temporally Evolving Haystack: A Scan Statistics Perspective
Quart. Appl. Math. 2019. *Ronak Mehta, Hyunwoo J. Kim, Shulei Wang, Sterling C. Johnson, Vikas Singh.*

Provably Robust Image Deconvolution via Mirror Descent
arXiv Preprint. *Sathya Ravi, Ronak Mehta, Vikas Singh.*

Reviewing Service

International Conference on Learning Representations (ICLR)	2023
Neural Information Processing Systems (NeurIPS)	2022
Association for the Advancement of Artificial Intelligence (AAAI)	2022
Computer Vision and Pattern Recognition (CVPR)	2021
Neural Information Processing Systems (NeurIPS)	2020
Computer Vision and Pattern Recognition (CVPR)	2020
Medical Image Computing and Computer Assisted Intervention (MICCAI)	2019

Skills

Programming Languages: Python, R, C++, MATLAB, Julia, HTML/JavaScript
Tools: Scikit-Learn, Tensorflow, PyTorch, Lme4, GGPlot, Pandas/NumPy/SciPy
Document Generation: LaTeX, Keynote, MS Office Suite