Divya Shanmugam

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Education

Massachusetts Institute of Technology — Expected 05/2024
Ph.D, Electrical Engineering and Computer Science

Massachusetts Institute of Technology — 05/2018
Master of Engineering, Electrical Engineering and Computer Science
Thesis: *Representation Learning for Improved Distance and Risk Metrics*

Massachusetts Institute of Technology — 05/2017
B.S., Electrical Engineering and Computer Science

Publications

* denotes equal contribution.

1. **D. Shanmugam**, E. Pierson, J. Guttag. "Improving absolute prevalence estimates for underreported outcomes in multi-class settings". *(in preparation)*

2. **D. Shanmugam**, K. Hou, E. Pierson. "Quantifying disparities in intimate partner violence: a machine learning method to correct for underreporting". *(under review)*

3. J. Gassen, S. Mengelkoch, **D. Shanmugam**, J. Pierson, A. van Lamsweerde, E. Benhar, S.E. Hill. "Longitudinal Changes in Desire and Attraction Among Women Who Have Discontinued Hormonal Contraceptives: A Preregistered Study of 1,596 Natural Cycles Users" *(under review)*.

4. R. Movva, **D. Shanmugam**, K. Hou, P. Pathak, J. Guttag, N. Garg, E. Pierson. "Coarse race data conceals disparities in clinical risk score performance". *MLHC 2023.*

5. **D. Shanmugam**, M. Espinosa, J. Gassen, A. van Lamsweerde, J. Pearson, E. Behar, S.E. Hill. "The Relationship Between Photoperiod and Ovulation Rate: A Multi-Site Study Using NaturalCycles data". *Scientific Reports 2023.*

6. H. Suresh, **D. Shanmugam**, A. Bryan, T. Chen, A. D'Amour, J. Guttag, A. Satyanarayan. "Kaleidoscope: Semantically-grounded, Context-specific Model Evaluation". *ACM CHI 2023*

7. A. Raghu, **D. Shanmugam**, E. Pomerantsev, J. Guttag, C. Stultz. "Data Augmentation for Electrocardiograms". *ACM CHIL 2022*

8. **D. Shanmugam**, S. Shabanian, F. Diaz, M. Finck, A. Biega. "Learning to Limit Data via Scaling Laws: A Computational Interpretation for the Legal Principle of Data Minimization". *ACM FAccT 2022*

9. **D. Shanmugam**, D. Blalock, G. Balakrishnan, J. Guttag. "Better Aggregation in Test-Time Augmentation". *ICCV 2021* (oral, top 3%)

10. **D. Shanmugam**, D. Blalock, J. Guttag. "Multiple Instance Learning for ECG Risk Stratification". *MLHC 2019* (oral)

11. J. Sahota*, **D. Shanmugam***, J. Ramanan, S. Eghbali, M. Brubaker. "Addressing Feature-Dependent Label Noise: A Generative Framework" *(preprint)*

Invited talks

1. *At the Intersection of Conceptual Art and Deep Learning: The End of Signature* List Center, October 2022.
2. *Quantifying Inequality in Underreported Conditions.* MIT AI Ethics Seminar, March 2022
3. *Quantifying Inequality in Underreported Conditions.* University of Chicago Crime and Education Lab, Virtual, December 2021
4. *Quantifying Inequality in Underreported Conditions.* Cornell Information Sciences Seminar, Virtual, November 2021
5. *Estimating the Relative Prevalence of Underreported Medical Conditions.* Microsoft Research New England, Virtual, July 2021
6. *Learning to Limit Data Collection using Scaling Laws.* Microsoft Research Montreal, Virtual, August 2020
7. *Machine Learning, Data Collection, and Women's Health.* Texas Christian University, Virtual, June 2020
8. *Multiple Instance Learning for ECG Risk Stratification.* University of Michigan, Ann Arbor, Michigan, August 2019

Professional Service

MENTORSHIP

William Hou, UROP	2022-2023
Helen Lu, MEng	2021-2023
Angela Zhang, UROP	2021-2022
Neha Hulkund, UROP	2020-2021
Roshni Sahoo, SuperUROP	2018-2020
Skylar Gordon, AI Mentee	2018-2019
Xinyi Guo, AI Mentee	2018-2019

REVIEWING

Fairness, Accountability and Transparency Conference	2022
Conference on Health, Inference, and Learning	2020, 2022
Machine Learning for Healthcare Conference	2020, 2021, 2022
Machine Learning for Health Symposium	2019, 2020, 2022
International Conference on Machine Learning	2021, 2022
Computer Vision and Pattern Recognition Conference	2021
Women in Machine Learning NeurIPS workshop	2018, 2020
Neural and Information Processing Systems	2020

Awards

Jane Street Fellowship 2022, Honorable Mention
Best Talk, GW6 Research Summit 2021
NSF Graduate Research Fellowship 2017

Workshops and poster sessions

1. *At the Intersection of Conceptual Art and Deep Learning*
   Broadening Research Collaborations Workshop (NeurIPS 2022). New Orleans, LA.

2. *Improved Test Classification using Test-Time Augmentation*
   UpdatableML Workshop (ICML 2022). Virtual.

3. *Day Length Predicts Ovulatory Shifts in Women's Reproductive Function*
   Society for Personality and Social Psychology Conference (SPSP 2022). San Francisco, CA.

4. *Learning to Limit Data Collection for Data Minimization Compliance*
   Women in Machine Learning Workshop, NeuRIPS 2020

5. *Unsupervised Domain Adaptation in the Absence of Source Data*
   Uncertainty & Robustness in Deep Learning Workshop, ICML 2020

6. *Image Segmentation of Liver Stage Malaria Infection with Spatial Uncertainty Sampling*
   Workshop on Computational Biology, ICML 2019

7. *Multiple Instance Learning for Cardiac Risk Stratification.*
   Women in Machine Learning Workshop, NeurIPS 2018 (oral presentation)

8. *Multiple Instance Learning for ECG Risk Stratification.*
   Machine Learning for Health Workshop, NeurIPS 2018

9. *ECG Risk Stratification Using Multiple Instance Learning.*
   MIT DSAIL 2018

10. *Jiffy: A Convolutional Approach to Learning Time Series Similarity.*
    MIT MasterWorks 2018

11. *A Convolutional Approach to Learning Time Series Similarity.*
    Women in Machine Learning Workshop, NeurIPS 2017

12. *Identifying and Accounting for Disparities in Language Due to Economic Class.*
    Women in Machine Learning Workshop, NeurIPS 2017

13. *Compressive Metagenomics*
    MIT Microbiome Center Symposium 2016