

# Divya Shanmugam

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## Academic positions and degrees

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<b>Cornell Tech</b> , New York, NY Postdoctoral Researcher, Department of Computer Science	2024 – Present
<b>Massachusetts Institute of Technology</b> , Cambridge, MA Ph.D., Electrical Engineering and Computer Science (05/2024) Thesis: <i>Advancing Equity and Reliability in Machine Learning.</i>	2018 – 2024
<b>Massachusetts Institute of Technology</b> , Cambridge, MA M.Eng., Electrical Engineering and Computer Science (05/2018) Thesis: <i>Representation Learning for Improved Distance and Risk Metrics.</i>	2017 – 2018
<b>Massachusetts Institute of Technology</b> , Cambridge, MA B.S., Electrical Engineering and Computer Science (05/2017)	2013 – 2017

## Honors

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Rising Star in EECS (MIT)	2025
Best Paper Award, Conference on Health, Inference, and Learning (CHIL)	2025
Honorable Mention Best Findings Paper, Machine Learning for Health (ML4H)	2023
Jane Street Fellowship (Honorable Mention)	2022
Best Talk, GW6 Research Summit	2021
National Science Foundation Graduate Research Fellowship	2017

## Publications

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\* denotes equal contribution.

<b>Machine learning reveals hidden diagnoses among underserved patients</b> D. Shanmugam, B. Hardy, A. Wang, S. Divikaran, E. Pierson**, M. Barnett**. <i>Under review.</i>	2025
<b>The Trillion Dollar Algorithm: Lessons from Machine Learning for Medicare Advantage Risk Adjustment</b> D. Shanmugam*, M. Johnson*, D. Meyers, J. Wiens, E. Pierson. <i>Under review at NEJM AI.</i>	2025
<b>Identifying Mechanisms of Disparities within Cascades of Cardiovascular Care after an Emergency Department Visit</b> A. Wang, D. Shanmugam, S. Divikaran, E. Pierson, M. Barnett. <i>Under review.</i>	2025
<b>Survival Analysis with Limited Overlap and Censoring Distribution Shift</b> M. Krishnamoorthy, D. Shanmugam, D. Tjandra, A. E. Kowalski, J. Wiens. <i>Under review.</i>	2025

<b>Evaluating multiple models using labeled and unlabeled data</b>	2025
D. Shanmugam*, S. Sadhuka*, M. Raghavan, J. Guttag, B. Berger**, E. Pierson**. <i>Neural Information Processing Systems (NeurIPS) 2025.</i>	
<b>Learning Disease Progression Models That Capture Health Disparities</b>	2025
E. Chiang, D. Shanmugam, A. Beecy, G. Sayer, N. Uriel, D. Estrin, N. Garg, E. Pierson. <i>Conference on Health, Inference, and Learning (CHIL) 2025.</i>	
<b>Test-time augmentation improves efficiency in conformal prediction</b>	2025
D. Shanmugam, H. Lu, S. Swaminarayan, J. Guttag. <i>IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) 2025.</i>	
<b>Generative Artificial Intelligence in Medicine</b>	2025
D. Shanmugam, M. Agrawal, R. Movva, I. Y. Chen, M. Ghassemi, M. Jacobs, E. Pierson. <i>Annual Review of Biomedical Data Science, 2025.</i>	
<b>Using large language models to promote health equity</b>	2025
E. Pierson*, D. Shanmugam*, R. Movva*, J. Kleinberg*, et al. <i>New England Journal of Medicine AI, 2025.</i>	
<b>Quantifying disparities in intimate partner violence: a machine learning method to correct for underreporting</b>	2024
D. Shanmugam, K. Hou, E. Pierson. <i>npj Women's Health, 2024.</i>	
<b>Longitudinal Changes in Desire and Attraction Among Women Who Have Discontinued Hormonal Contraceptives</b>	2024
J. Gassen, S. Mengelkoch, D. Shanmugam, J. Pierson, A. van Lamsweerde, E. Benhar, S. E. Hill. <i>Hormones and Behavior, 2024.</i>	
<b>Coarse race data conceals disparities in clinical risk score performance</b>	2023
R. Movva*, D. Shanmugam*, K. Hou, P. Pathak, J. Guttag, N. Garg, E. Pierson. <i>Machine Learning for Healthcare Conference (MLHC) 2023.</i>	
<b>The Relationship Between Photoperiod and Ovulation Rate: A Multi-Site Study Using NaturalCycles Data</b>	2023
D. Shanmugam, M. Espinosa, J. Gassen, A. van Lamsweerde, J. Pearson, E. Behar, S. E. Hill. <i>Scientific Reports, 2023.</i>	
<b>Kaleidoscope: Semantically-grounded, Context-specific Model Evaluation</b>	2023
H. Suresh, D. Shanmugam, A. Bryan, T. Chen, A. D'Amour, J. Guttag, A. Satyanarayanan. <i>ACM CHI Conference on Human Factors in Computing Systems (CHI) 2023.</i>	
<b>Data Augmentation for Electrocardiograms</b>	2022
A. Raghu, D. Shanmugam, E. Pomerantsev, J. Guttag, C. Stultz. <i>ACM Conference on Health, Inference, and Learning (CHIL) 2022.</i>	

<b>Learning to Limit Data via Scaling Laws: A Computational Interpretation for the Legal Principle of Data Minimization</b>	2022
D. Shanmugam, S. Shabanian, F. Diaz, M. Finck, A. Biega.	
<i>ACM Conference on Fairness, Accountability, and Transparency (FAccT) 2022.</i>	
<b>Better Aggregation in Test-Time Augmentation</b>	2021
D. Shanmugam, D. Blalock, G. Balakrishnan, J. Guttag.	
<i>IEEE/CVF International Conference on Computer Vision (ICCV) 2021. (Oral, top 3%).</i>	
<b>Multiple Instance Learning for ECG Risk Stratification</b>	2019
D. Shanmugam, D. Blalock, J. Guttag.	
<i>Machine Learning for Healthcare Conference (MLHC) 2019. (Oral).</i>	

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## Selected talks

### **Reliable machine learning with health data**

<i>Applied Data Science, Cornell Tech, New York, NY</i>	2025
<i>AI &amp; Public Policy Seminar, Cornell Tech, New York, NY</i>	2025
<i>Wadhwani School of Data Science &amp; AI Seminar, IIT Madras, Virtual</i>	2025

### **Methods to Evaluate the Quality of Clinical Care**

<i>INFORMS, Atlanta, GA</i>	2025
<i>International Conference on Statistics and Data Science (ICSDS), Vancouver, CA</i>	2025
<i>Center for Population Health (CPH), UC Berkeley, Berkeley, CA</i>	2025
<i>UVA School of Data Science, Charlottesville, VA</i>	2025
<i>Healthy ML Group, MIT, Cambridge, MA</i>	2025
<i>Diversity in Health Data: Achieving Benefit for All, Virtual</i>	2025

### **The Medicare Advantage Algorithm**

<i>AI &amp; Public Policy Seminar, Cornell University, Ithaca, NY</i>	2025
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### **Advancing Equity & Reliability in Machine Learning**

<i>Statistical Methods for Health Equity, Data Science for Health Equity, Virtual</i>	2024
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### **All the Data We Cannot See**

<i>AI and Medicine Workshop, Mt. Sinai, New York, NY</i>	2024
<i>Computational Healthcare for Equity and iNclusion Lab, UC Berkeley, Berkeley, CA</i>	2023

### **Quantifying Inequality in Underreported Conditions**

<i>MIT Algorithmic Fairness Reading Group, Cambridge, MA</i>	2023
<i>MIT AI Ethics Seminar, Cambridge, MA</i>	2022
<i>University of Chicago Crime and Education Lab, Virtual</i>	2021
<i>Cornell Information Science Seminar, Virtual</i>	2021
<i>Microsoft Research New England, Virtual</i>	2021

### **At the Intersection of Conceptual Art and Deep Learning: The End of Signature**

*List Center, Cambridge, MA*

2022

### **Learning to Limit Data Collection using Scaling Laws**

*Microsoft Research Montreal, Virtual*

2020

### **Machine Learning, Data Collection, and Women's Health**

*Texas Christian University, Virtual*

2020

## **Mentorship**

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Helen Lu (2021–2024); William Hou (2022–2023); Anna Bryan (2021–2022); Tiffany Chen (2021–2022); Angela Zhang (2021–2022); Neha Hulkund (2020–2021); Roshni Sahoo (2018–2020); Skylar Gordon (2018–2019); Xinyi Guo (2018–2019).

## **Professional Service**

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### **Leadership**

Organizing Committee, Workshop Chair, MLHC	2025
Organizing Committee, Publicity Chair, FAccT	2025
Organizing Committee, Workflow Chair, ML4H	2023
Applied Machine Learning Seminar Organizer, MIT	2023
Undergraduate Mentorship Improvement Initiative, MIT	2020 – 2021
GW6 Event Coordinator, MIT	2018 – 2019
MIT AI Mentorship Program Coordinator, MIT	2018 – 2020

### **Reviewing**

Conference on Fairness, Accountability, and Transparency (FAccT)	2022 – 2025
Conference on Health, Inference, and Learning (CHIL)	2020, 2022
Machine Learning for Healthcare (MLHC)	2020 – 2023
Machine Learning for Health Symposium (ML4H)	2019 – 2022
International Conference on Machine Learning (ICML)	2021 – 2022
Computer Vision and Pattern Recognition (CVPR)	2021
Women in Machine Learning (WiML), NeurIPS Workshop	2018, 2020
Neural Information Processing Systems (NeurIPS)	2020

### **Community Outreach**

Reviews and Rebuttals Mentorship Panel (ML4H) – Panelist	2025
Round Table on Algorithmic Fairness (ML4H) – Discussant	2025
AI and Geriatrics Workshop (Johns Hopkins) – Invited participant	2025
AI and Society Panel (Olin College) – Panelist	2023
Career Mentorship Panel (MIT) – Panelist	2021
Graduate Student Panel (McCormick Hall) – Panelist	2020
Graduate Student Panel (MIT Women in EECS) – Panelist	2019
Lightning Talks (MIT Women in EECS) – Speaker	2017