Shalmali Joshi

Curriculum Vitae

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Current Position
Assistant Professor, DBMI, Columbia University

Past Affiliations
CRCS at Harvard University (SEAS); Vector Institute; IDEA Lab, WNCG at UT Austin

Education

'13- '18	Ph.D., Electrical & Computer Engg	UT Austin (Advisor: Joydeep Ghosh)
'09-'11	M.S., Electrical & Computer Engg	UC, San Diego
'05-'09	B. Tech., Electrical Engg	Vishveshvaraya Natl. Inst. of Tech., India

Work Experience [Employment History]

Feb '23-	Assistant Professor	**Columbia University**, New York, US
Oct '20-Dec '22	CRCS Postdoctoral Fellow	**Harvard University**, Cambridge, US
Nov '18-Sep '20	Postdoctoral Fellow	**Vector Institute**, Toronto, CA
Sept '13-Dec '18	Graduate Research Assistant	**UT Austin**, Austin, US
Jun '11-Jun '13	Software Engineer	**Amazon Lab 126**, Sunnyvale, US

Scientific products

Manuscripts - In Submission

1. **Shalmali Joshi***, Sonali Parbhoo*, and Finale Doshi-Velez. Generalizing off-policy evaluation from a causal perspective for sequential decision-making. *arXiv preprint arXiv:2201.08262*, 2022 [arXiv]

2. **Shalmali Joshi***, Sonali Parbhoo*, and Finale Doshi-Velez. Learning-to-defer for sequential medical decision-making un- der uncertainty. *(Under Review)*, 2021 [arXiv]

3. Haoran Zhang, Harvineet Singh, Marzyeh Ghassemi, and **Shalmali Joshi**. Why did the model fail?: Attributing model performance changes to distribution shifts. *(Under Review)*, 2022 [arXiv]

Publications - Conference and Journal

4. Daniel E Ehrmann, **Shalmali Joshi**, Sebastian D Goodfellow, Mjaye L Mazwi, and Danny Eytan. Making machine learning matter to clinicians: model actionability in medical decision-making. ***NPJ Digital Medicine***, 2023[arXiv]

5. Harvineet Singh, **Shalmali Joshi**, Finale Doshi-Velez, and Himabindu Lakkaraju. Towards robust off-policy evaluation via human inputs. In **AI Ethics and Society**. **AAAI/ACM**, 2022 [arXiv]

6. Taylor Killian, Marzyeh Ghassemi, and **Shalmali Joshi**. Counterfactually guided policy transfer in clinical settings. In ***Proceedings of the Conference on Health, Inference, and Learning***. **PMLR**, 2022 [arXiv]

7. Martin Pawelczyk, Chirag Agarwal, **Shalmali Joshi**, Sohini Upadhyay, and Himabindu Lakkaraju. Exploring counterfactual explanations through the lens of adversarial examples: A theoretical and empirical analysis. ***25th International Conference on Artificial Intelligence and Statistics***, 2022 [arXiv]

8. Sohini Upadhyay*, **Shalmali Joshi***, and Himabindu Lakkaraju. Towards robust and reliable algorithmic recourse. ***Neural Information Processing Systems***, 2021 [arXiv]

9. Sindhu C M Gowda, **Shalmali Joshi**, Haoran Zhang, and Marzyeh Ghassemi. Pulling up by the causal bootstraps: Causal data augmentation for pre-training debiasing. ***30th ACM International Conference on Information and Knowledge Management***, 2021 [arXiv]

10. Haoran Zhang, Natalie Dullerud, Laleh Seyyed-Kalantari, Quaid Morris, **Shalmali Joshi**, and Marzyeh Ghassemi. An empirical framework for domain generalization in clinical settings. In ***Proceedings of the Conference on Health, Inference, and Learning***, 2021 [url]

11. Victoria Cheng, Vinith M Suriyakumar, Natalie Dullerud, **Shalmali Joshi**, and Marzyeh Ghassemi. Can you fake it until you make it? impacts of differentially private synthetic data on downstream classification fairness. In ***Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency***, pages 149–160, 2021 [url]

12. Shirly Wang, Seung Eun Yi, **Shalmali Joshi**, and Marzyeh Ghassemi. Confounding feature acquisition for causal effect estimation. In **Machine Learning for Health**, pages 379–396. **PMLR**, 2020 [url]

13. Irene Y. Chen, Emma Pierson, Sherri Rose, **Shalmali Joshi**, Kadija Ferryman, and Marzyeh Ghassemi. Ethical machine learning in healthcare. ***Annual Review of Biomedical Data Science***, 2021 [url]

14. Irene Y* Chen, **Shalmali Joshi***, Marzyeh Ghassemi, and Rajesh Ranganath. Probabilistic machine learning for healthcare. ***Annual Review of Biomedical Data Science***, 4, 2020 [url]

15. Sana Tonekaboni*, **Shalmali Joshi***, Kieran Campbell, David Duvenaud, and Anna Goldenberg. What went wrong and when? instance-wise feature importance for time-series models. In ***NeuRIPS***, 2020 [url]

16. Melissa McCradden, **Shalmali Joshi**, James Anderson, and Mjaye Mazwi. When your only tool is a hammer: ethical limitations of computational fairness solutions in healthcare machine learning **(Oral)**. In ***Lancet Digital Health, AAAI Conference on AI Ethics & Society (AIES), Fair ML for Health Workshop at NeurIPS***, 2020 [url]

17. Irene Chen, **Shalmali Joshi**, and Marzyeh Ghassemi. Treating health disparities with Artificial Intelligence. In ***Nature Medicine***, 2020 [url]

18. **Shalmali Joshi***, Sana Tonekaboni*, Melissa McCradden, and Anna Goldenberg. What clinicians want: Contextualizing explainable machine learning for clinical end use. In ***Machine Learning for Healthcare (MLHC)***, 2019 [url]

19. **Shalmali Joshi**, Rajiv Khanna, and Joydeep Ghosh. Co-regularized monotone regtargeting for semi-supervised LeTOR. In ***Siam International Conference on Data Mining (SDM)*** , 2018 [url]

20. **Shalmali Joshi**, Suriya Gunasekar, David Sontag, and Joydeep Ghosh. Identifiable phenotyping using constrained Non-Negative matrix factorization. In ***Machine Learning for Healthcare Conference (MLHC)***, 2016 [url]

21. **Shalmali Joshi**, Joydeep Ghosh, Mark Reid, and Oluwasanmi Koyejo. Rényi divergence minimization based co-regularized multiview clustering. **Machine Learning**, 2016 [url]

22. **Shalmali Joshi**, Oluwasanmi Koyejo, Kristine Resurreccion, and Joydeep Ghosh. Simultaneous prognosis and exploratory analysis of multiple chronic conditions using clinical notes. In ***International Conference on Healthcare Informatics (ICHI)***, 2015 [url]

Peer Reviewed Workshop/Abstracts

23. Haoran Zhang, Harvineet Singh, and **Shalmali Joshi**. Why did the model fail?: Attributing model performance changes to distribution shifts. In **Workshop on Spurious Correlations, Invariance and Stability @ ICML**, 2022

24. Martin Pawelczyk, **Shalmali Joshi**, Chirag Agarwal, Sohini Upadhyay, and Himabindu Lakkaraju. On the connections between counterfactual explanations and adversarial examples. ***ICML Workshop on Algorithmic Recourse***, 2021 [arXiv]

25. Sonali Parbhoo* and **Shalmali Joshi***. On formalizing causal off-policy evaluation for sequential decision-making. ***ICML Workshop on Neglected Assumptions in Causal Inference***, 2021

26. Arnold Yeung, **Shalmali Joshi**, Joseph Williams, and Frank Rudzicz. Sequential explanations with mental model-based policies. In ***Workshop on Human Interpretability in Machine Learning at ICML***, 2020 [arXiv]

27. Sana Tonekaboni, **Shalmali Joshi**, and Anna Goldenberg. Individualized feature importance for time series risk prediction models. In ***Machine Learning for Health Workshop at NeurIPS***, 2019

28. Seungeun Yi*, Shirly Wang*, **Shalmali Joshi**, and Marzyeh Ghassemi. Fair and robust treatment effect estimates: Estimation under treatment and outcome disparity with deep neural models. In ***Fair ML for Health Workshop at NeurIPS***, 2019

29. Melissa McCradden, Sana Tonekaboni, **Shalmali Joshi**, and Anna Goldenberg. Five pillars of explainable clinical machine learning. In ***Frontier of AI-Assisted Care (FAC), Scientific Symposium***, 2019

30. **Shalmali Joshi**, Oluwasanmi Koyejo, Been Kim, Warut Vijitbenjaronk, and Joydeep Ghosh. Towards realistic individual recourse and actionable explanations in black-box decision making systems. In ***SafeML Workshop at the International Conference on Learning Representations (ICLR)***, 2019

31. **Shalmali Joshi**, Been Kim, Oluwasanmi Koyejo, and Joydeep Ghosh. Through the looking GANs. In ***Women in Machine Learning Workshop @ NeurIPS***, 2017

32. **Shalmali Joshi**, Oluwasanmi Koyejo, and Joydeep Ghosh. Multiview clustering via constrained bayesian inference. In ***Workshop on Divergence Methods for Probabilistic Inference at ICML***, 2014

Theses

33. **Shalmali Joshi**. *Constraint based Approaches to Interpretable and Semi-Supervised Machine Learning*. PhD thesis, The University of Texas at Austin, December 2018

*Equal Contribution.

Invited Talks and Presentations

October '22: Guest Lecture: Causal Inference and Applications to Explainability and Fairness in ML, UT Austin

October '22: Panelist: AI in South Asia, Lakshmi Mittal Institute, Harvard University

March, '22: New York University, CS Colloquium

March, '22: Rice University, CS Colloquium

February, '22: University of Maryland Baltimore County, College of Engineering

February, '22: Columbia University, Dept. of Biomedical Informatics

February, '22: UC Berkeley-UC San Francisco, Computational Precision Health

February, '22: University of Waterloo, Dept. of Computer Science

February, '22: Vanderbilt University, Dept. of Computer Science

January, '22: Emory University, Dept. of Quantitative Theory & Methods

January, '22: Ohio State University, Dept. of Computer Science

January, '22: IST Austria, Dept. of Computer Science

January, '22: Max Planck Institute for Intelligent Systems

January, '22: University of Amsterdam, AMLab

December, '21: Keynote talk: ML4H Symposium

November '21: Symposium for Machine Learning Implementation & Evaluation, NYU Langone

August, '21: Invited Guest Lecture: Indian Institute of Technology, Madras on Explainability in Healthcare: From application oriented approaches to ethics of deployment

July, '21: Keynote talk: Ethics of developing ML in healthcare at the ICML Workshop on Challenges in Deploying and monitoring Machine Learning Systems

April, '21: Moderator: Panel on the role of AI in Health Equity, CRCS, Harvard University

March, '21: Guest Lecture: Causality Primer and Applications in ML in the Probabilistic Graphical Modeling at UIUC

March, '21: Guest Lecture: Learning robust recourses in the Topics in Machine Learning: Interpretability and Explainability at Harvard University

March, '21: FAccT Tutorial on limitations of explainability methods in ML

July, '20: Data Science Africa: Ethics for ML in Healthcare

March, '20: Guest Lecture, on Fairness, Explainability in ML, AI and Society Class at McMaster University

January, '20: Guest Lecture, Causal Inference in ML for Health Graduate Class UofT CS

November, '19: Guest Lecture, AI and Ethics Graduate Class UofT CS

November, '19: The 99 AI Challenge cohort with University of Toronto Libraries

November, '19: CSI Departmental Seminar, Emory University, Atlanta, Georgia

October, '19: Data & Society Meeting at NYU on Evaluating Fairness for ML in Health

August, '19: Launch event of the Schwartz Reisman Institute for Technology and Society (SRIT&S) on fairness and explainability in health

Teaching experience (Teaching Assistant)

Fall '15	Advanced Predictive Modeling	McCombs School of Business, UT Austin
Fall '14	Graduate Data Mining	Electrical & Computer Engg., UT Austin
Spring '14	Graduate Data Mining	Electrical & Computer Engg., UT Austin

Internship Experience

Summer '15	Technical Intern	**Yahoo! Labs**, Sunnyvale, CA, US
Summer '10	HPC Algorithms Intern	**Life Technologies**, Carlsbad, CA, US
Summer '07	Undergraduate Researcher	**IIT Madras, India**

Service

Area Chair	NeurIPS, FAccT	2023
Reviewer	ICML, UAI, TMLR	2023
Reviewer	Patterns, a Cell Journal	2022
Reviewer	AISTATS, ICLR, ICML, MLHC, NeurIPS	2022
Program Chair	Machine Learning for Healthcare (MLHC)	2023
General Chair	Machine Learning for Health Symposium (ML4H)	2022
Reviewer	Nature Machine Intelligence, Nature Medicine, Scientific Reports	2022
Area Chair	NeurIPS Datasets & Benchmark Track	2022
Ethics Reviewer	NeurIPS	2022
Reviewer	AISTATS, ICLR, ICML, MLHC, NeurIPS	2022
Reviewer	CausalNLP @EMNLP, Causal Inference & Machine Learning: Dist Shift @ NeurIPS, ML4H Symposium	2021
Meta-reviewer	AAAI, CHIL	2022
Ethics Reviewer	NeurIPS	2021
Reviewer	ICML, MLHC, NeurIPS (Main track, Datasets and Benchmarks track), Nature Digital Medicine	2021
Area Chair	ACM FAccT	2021
Track Lead	ACM Conference on Health, Inference, and Learning (CHIL)	2021
Comms Chair	ACM Conference on Health, Inference, and Learning (CHIL)	2020
Reviewer	NeurIPS, AAAI, AISTATS, ICLR	2020
Co-chair	NeurIPS Workshop, Fairness in Machine Learning for Health	2019
Reviewer	AAAI, ICLR, AISTATS, NeurIPS, ICML, Nature Medicine	2019
PC Member	ICLR Workshop, DebugML	2019
PC Member	NeurIPS Workshop, Machine Learning for Health	2018
Reviewer	MLHC, WiML@NeurIPS (Women In Machine Learning), ML4H Workshop at NeurIPS	2017
Reviewer	NeurIPS, ICML, TKDD	2015

Awards

2021	MIT-EECS Rising Stars Award
2017	WiML@NIPS Travel Award
2015	IEEE ICHI Travel Award
2003	National Talent Search Scholarship, Govt. of India

Technical Skills

Programming/Scripting	Expert: Python, MATLAB, Bash Competent: C++, C, R, XML,Perl
Libraries, Tools, IDEs	Expert: PyTorch, Tensorflow, scikit_learn, numpy, scipy, vim Competent: STL, Cvx, openCV, Qt Creator, RStudio, PyCharm, CUDA API, gcc, gdb, LibSVM
Versioning Tools	Expert: Git, svn
Operating Systems	OSx, Linux

References

Available Upon Request