Kush R. Varshney

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Education:

Massachusetts Institute of Technology, Cambridge, MA, USA
Doctor of Philosophy in Electrical Engineering and Computer Science, 2010
Thesis: Frugal Hypothesis Testing and Classification
Committee: Alan S. Willsky (advisor), John W. Fisher, III, Polina Golland, and Joshua B. Tenenbaum
Minor: linguistics

Electrical Engineer, 2010

Master of Science in Electrical Engineering and Computer Science, 2006
Thesis: Joint Anisotropy Characterization and Image Formation in Wide-Angle Synthetic Aperture Radar
Advisors: Müjdat Çetin and John W. Fisher, III
Cumulative GPA 5.00 (A = 5.00)

Cornell University, Ithaca, NY, USA
Bachelor of Science (magna cum laude) in Electrical and Computer Engineering, 2004
Honors Project: Greedy Postprocessing for Spatial Error Concealment in MPEG Video
Advisor: Sheila S. Hemami
Minor: computer science
Cumulative GPA 3.93 (A = 4.00)

Research and Industry Experience:

Distinguished research staff member and manager, *IBM Research*, Thomas J. Watson Research Center, Yorktown Heights, NY, USA, since April 2020.

Principal research staff member and manager, *IBM Research*, Thomas J. Watson Research Center, Yorktown Heights, NY, USA, March 2018–April 2020. (Visiting IBM Research – Africa, Nairobi, Kenya, August 2019–November 2019.)

Research staff member and manager, *IBM Research*, Thomas J. Watson Research Center, Yorktown Heights, NY, USA, December 2016 – March 2018.

Research staff member, *IBM Research*, Thomas J. Watson Research Center, Yorktown Heights, NY, USA, November 2010–December 2016.

Post doctoral researcher, *IBM Research*, Thomas J. Watson Research Center, Yorktown Heights, NY, USA, April–November 2010.

Research assistant, Laboratory for Information and Decision Systems, *Massachusetts Institute of Technology*, Cambridge, MA, USA, October 2004–February 2010.

Intern, Systems and Decision Sciences Section, National Security Engineering Division, *Lawrence Livermore National Laboratory*, Livermore, CA, USA, May–August 2009. (Department of Energy P Clearance.)

Visiting researcher, Laboratoire de Mathématiques Appliquées aux Systèmes, *École Centrale Paris*, Châtenay-Malabry, France, May–August 2006.

Co-op intern, Enterprise Server Products Group, *Sun Microsystems*, Burlington, MA, USA, September 2002–January 2003 and May–August 2003.

Intern, Air Traffic Systems Division, *Sensis Corporation*, DeWitt, NY, USA, May–August 2001.

Summer research volunteer, Nuclear Medicine Division, *State University of New York Health Science Center*, Syracuse, NY, USA, June–September 1998.

Honors:

Winner, Science and Innovation Management Breakthrough, Falling Walls Science Summit, 2022 (for AI Fairness 360).

Tech Spotlight Runner-Up, Belfer Center for Science and International Affairs, Harvard Kennedy School, 2020 (for AI Fairness 360).

IBM Corporate Technical Award

- AI-Powered Employee Journey, 2021.
- Trustworthy AI, 2021.

IBM Research Technical Accomplishments

- Extraordinary Accomplishment
  - Research Contributions to Workforce Innovation & Enterprise Transformation,† 2015.
- Outstanding Accomplishment
  - Trustworthy AI,* 2019;
  - Computational Creativity, 2014;
  - GMU Proactive Retention, 2013.
- Accomplishment
  - Science of Uncertainty Quantification, 2021;
  - Data-Driven Discovery in Global Health, 2021;
  - Dictionary- and Sparsity-Driven Imaging,* 2018;
  - IBM Leadership in Fight Against Ebola,* 2015;
  - WellPoint Health Insurance Exchanges Analytics, 2013;
  - Computational Creativity for Culinary Recipes,‡ 2013;
  - Analytics-Driven Proactive Retention in the Growth Markets Unit,† 2012;
  - Business Impact of Outsourcing Analytics,† 2011;
  - Software Group Sales Analytics,* 2011.

*Also IBM Outstanding Technical Achievement Award
†Also IBM Research Division Award
‡Also IBM Outstanding Innovation Award

Paper Awards

- Best Paper Addressing Opportunities in AI, Computing Community Consortium / Schmidt Futures Computer Science for Social Good White Paper Competition, 2019.

- Best Research Paper Honorable Mention, SIAM International Conference on Data Mining, 2015.
- Best Social Good Paper Award, ACM SIGKDD Conference on Knowledge Discovery and Data Mining, 2014.
- Best Paper Award, IEEE International Conference on Service Operations and Logistics, and Informatics, 2013.
- Best Student Paper Travel Award, International Conference on Information Fusion, 2009.

Contributor to WellPoint Team, Gerstner Award for Client Excellence (most prestigious internal award at IBM), 2013.

IBM Eminence and Excellence Award
- Research Contributions to Trust and Transparency for AI on the IBM Cloud, 2018.
- WellPoint/IBM Healthcare Predictive Analytics Project, 2012.

National Science Foundation Graduate Research Fellow, 2004–2009.

John McMullen Dean's Scholar, 2000–2004.

Eta Kappa Nu (electrical and computer engineering honor society), inducted 2003.

Tau Beta Pi (engineering honor society), inducted 2003.

Lockheed Martin Award for Academic Excellence (awarded to five outstanding sophomores in School of Electrical and Computer Engineering, Cornell University), 2002.

Rensselaer Medal, 1999.

Research Interests:

Signal processing: detection and estimation theory, sparse signal representation, quantization

Machine learning: interpretable models, fairness and privacy, topological data analysis

Image processing: image formation, image segmentation, level set methods, remote sensing

Applications: workforce analytics, public affairs, olfaction, international development, health care

Publications:

Books and Booklets
Trustworthy Machine Learning. Kush R. Varshney. Independently Published, Chappaqua, NY, USA, 2022.

AI Fairness: How to Measure and Reduce Unwanted Bias in Machine Learning. Trisha Mahoney, Kush R. Varshney, and Michael Hind. O'Reilly Media, Sebastopol, CA, USA, 2020.

Book Chapters
Learning Interpretable Classification Rules with Boolean Compressed Sensing. Dmitry M. Malioutov, Kush R. Varshney, Amin Emad, and Sanjeeb Dash. *Transparent Data Mining for Big and Small Data*, p.

95–121. Tania Cerquitelli, Daniele Quercia, and Frank Pasquale, editors. Cham, Switzerland: Springer, 2017.

Legislative Prediction with Political and Social Network Analysis. Jun Wang, Kush R. Varshney, and Aleksandra Mojsilović. *Encyclopedia of Social Network Analysis and Mining*, p. 804–811. Reda S. Alhajj and Jon G. Rokne, editors. Heidelberg, Germany: Springer, 2014.

Automatic Fingerprint Matching Systems. Kush R. Varshney. *Glimpses of Systems Theory and Novel Applications: Felicitation Volume in Honour of Professor Raj Kumar Varshney*, p. 149–164. Harjinder Singh Sekhon et al., editors. Aligarh, India: Navin Press, 2005.

Journal and Magazine Articles

Human-Centered Explainability for Life Sciences, Healthcare and Medical Informatics. Sanjoy Dey, Prithwish Chakraborty, Bum Chul Kwon, Amit Dhurandhar, Mohamed Ghalwash, Fernando J. Suarez Saiz, Kenney Ng, Daby Sow, Kush R. Varshney, and Pablo Meyer. *Patterns*, vol. 3, no. 5, p. 100493, May 2022.

A Human-Centered Methodology for Creating AI FactSheets. John Richards, David Piorkowski, Michael Hind, Stephanie Houde, Aleksandra Mojsilović, and Kush R. Varshney. *Bulletin of the Technical Committee on Data Engineering*, vol. 44, no. 4, p. 47–58, December 2021.

Interventional Fairness with Indirect Knowledge of Unobserved Protected Attributes. Sainyam Galhotra, Karthikeyan Shanmugam, Prasanna Sattigeri, and Kush R. Varshney. *Entropy*, vol. 23, no. 12, p. 1571, November 2021.

Socially Responsible AI Algorithms: Issues, Purposes, and Challenges. Lu Cheng, Kush R. Varshney, and Huan Lu. *Journal of Artificial Intelligence Research*, vol. 71, p. 1137–1181, August 2021.

AI Explainability 360: An Extensible Toolkit for Understanding Data and Machine Learning Models. Vijay Arya, Rachel K. E. Bellamy, Pin-Yu Chen, Amit Dhurandhar, Michael Hind, Samuel C. Hoffman, Stephanie Houde, Q. Vera Liao, Ronny Luss, Aleksandra Mojsilović, Sami Mourad, Pablo Pedemonte, Ramya Raghavendra, John Richards, Prasanna Sattigeri, Karthikeyan Shanmugam, Moninder Singh, Kush R. Varshney, Dennis Wei, and Yunfeng Zhang. *Journal of Machine Learning Research*, vol. 21, no. 130, p. 1-6, June 2020.

FactSheets: Increasing Trust in AI Services through Supplier's Declarations of Conformity. Matthew Arnold, Rachel K. E. Bellamy, Michael Hind, Stephanie Houde, Sameep Mehta, Aleksandra Mojsilović, Ravi Nair, Karthikeyan Natesan Ramamurthy, Alexandra Olteanu, David Piorkowski, Darrell Reimer, John Richards, Jason Tsay, and Kush R. Varshney. *IBM Journal of Research and Development*, vol. 63, no. 4/5, p. 6, July/September 2019.

AI Fairness 360: An Extensible Toolkit for Detecting and Mitigating Algorithmic Bias. Rachel K. E. Bellamy, Kuntal Dey, Michael Hind, Samuel C. Hoffman, Stephanie Houde, Kalapriya Kannan, Pranay Lohia, Jacquelyn Martino, Sameep Mehta, Aleksandra Mojsilović, Seema Nagar, Karthikeyan Natesan Ramamurthy, John Richards, Diptikalyan Saha, Prasanna Sattigeri, Moninder Singh, Kush R. Varshney, and Yunfeng Zhang. *IBM Journal of Research and Development*, vol. 63, no. 4/5, p. 4, July/September 2019.

Fairness GAN: Generating Datasets with Fairness Properties Using a Generative Adversarial Network. Prasanna Sattigeri, Samuel C. Hoffman, Vijil Chenthamarakshan, and Kush R. Varshney. *IBM Journal of Research and Development*, vol. 63, no. 4/5, p. 3, July/September 2019.

Teaching AI Agents Ethical Values Using Reinforcement Learning and Policy Orchestration. Ritesh Noothigattu, Djallel Bouneffouf, Nicholas Mattei, Rachita Chandra, Piyush Madan, Kush R. Varshney, Murray Campbell, Moninder Singh, and Francesca Rossi. *IBM Journal of Research and Development*, vol. 63, no. 4/5, p. 2, July/September 2019.

Think Your Artificial Intelligence Software is Fair? Think Again. Rachel K. E. Bellamy, Kuntal Dey, Michael Hind, Samuel C. Hoffman, Stephanie Houde, Kalapriya Kannan, Pranay Lohia, Sameep Mehta, Aleksandra Mojsilović, Seema Nagar, Karthikeyan Natesan Ramamurthy, John Richards, Diptikalyan Saha, Prasanna Sattigeri, Moninder Singh, Kush R. Varshney, and Yunfeng Zhang. *IEEE Software*, vol. 36, no. 4, p. 76–80, July–August 2019.

Confronting Data Sparsity to Identify Potential Sources of Zika Virus Spillover Infection Among Primates. Barbara A. Han, Subhabrata Majumdar, Flavio P. Calmon, Benjamin S. Glicksberg, Raya Horesh, Abhishek Kumar, Adam Perer, Elisa B. von Marschall, Dennis Wei, Aleksandra Mojsilović, and Kush R. Varshney. *Epidemics*, vol. 27, p. 59–65, June 2019.

Trustworthy Machine Learning and Artificial Intelligence. Kush R. Varshney. *ACM XRDS Magazine*, vol. 25, no. 3, p. 26–29, Spring 2019.

A Big Data Approach to Computational Creativity: The Curious Case of Chef Watson. Lav R. Varshney, Florian Pinel, Kush R. Varshney, Debarun Bhattacharjya, Angela Schörgendorfer and Yi-Min Chee. *IBM Journal of Research and Development*, vol. 63, no. 1, p. 7, January–February 2019.

Distribution-Preserving k-Anonymity. Dennis Wei, Karthikeyan Natesan Ramamurthy, and Kush R. Varshney. *Statistical Analysis and Data Mining*, vol. 11, no. 6, p. 253–270, December 2018.

Data Pre-Processing for Discrimination Prevention. Flavio P. Calmon, Dennis Wei, Bhanukiran Vinzamuri, Karthikeyan Natesan Ramamurthy, and Kush R. Varshney. *IEEE Journal of Selected Topics in Signal Processing*, vol. 12, no. 5, p. 1106–1119, October 2018.

How to Foster Innovation: A Data-Driven Approach to Measuring Economic Competitiveness. Caitlin Kuhlman, Karthikeyan Natesan Ramamurthy, Prasanna Sattigeri, Aurélie C. Lozano, Lei Cao, Chandra Reddy, Aleksandra Mojsilović, and Kush R. Varshney. *IBM Journal of Research and Development*, vol. 61, no. 6, p. 11, November–December 2017.

Dataflow Representation of Data Analyses: Towards a Platform for Collaborative Data Science. Evan Patterson, Robert McBurney, Hollie Schmidt, Ioana Baldini, Aleksandra Mojsilović, and Kush R. Varshney. *IBM Journal of Research and Development*, vol. 61, no. 6, p. 9, November–December 2017.

Real-Time Understanding of Humanitarian Crises via Targeted Information Retrieval. Kien T. Pham, Prasanna Sattigeri, Amit Dhurandhar, Arpith C. Jacob, Maja Vukovic, Patrice Chataigner, Juliana Freire, Aleksandra Mojsilović, and Kush R. Varshney. *IBM Journal of Research and Development*, vol. 61, no. 6, p. 7, November–December 2017.

Understanding the Ecospace of Philanthropic Projects. Hemank Lamba, Mary E. Helander, Moninder Singh, Nizar Lethif, Anuradha Bhamidipaty, Salman Baset, Aleksandra Mojsilović, and Kush R. Varshney. *IBM Journal of Research and Development*, vol. 61, no. 6, p. 6, November–December 2017.

Effectiveness of Peer Detailing in a Diarrhea Program in Nigeria. Yumeng Tao, Debarun Bhattacharjya, Aliza R. Heching, Aditya Vempaty, Moninder Singh, Felix Lam, Jason Houdek, Mohammed Abubakar,

Ahmad Abdulwahab, Tiwadayo Baraimoh, Nnenna Ihebuzor, Aleksandra Mojsilović, and Kush R. Varshney. *IBM Journal of Research and Development*, vol. 61, no. 6, p. 1, November–December 2017.

On the Safety of Machine Learning: Cyber-Physical Systems, Decision Sciences, and Data Products. Kush R. Varshney and Homa Alemzadeh. *Big Data*, vol. 5, no. 3, p. 246–255, September 2017.

Signal Processing for Social Good. Kush R. Varshney. *IEEE Signal Processing Magazine*, vol. 34, no. 3, p. 112, 108, May 2017.

Decision Making with Quantized Priors Leads to Discrimination. Lav R. Varshney and Kush R. Varshney. *Proceedings of the IEEE*, vol. 105, no. 2, p. 241–255, February 2017.

Associative Algorithms for Computational Creativity. Lav R. Varshney, Jun Wang, and Kush R. Varshney. *Journal of Creative Behavior*, vol. 50, no. 3, p. 211–223, September 2016.

Olfactory Signal Processing. Kush R. Varshney and Lav R. Varshney. *Digital Signal Processing*, vol. 48, p. 84–92, January 2016.

Data Challenges in Disease Response: The 2014 Ebola Outbreak and Beyond. Kush R. Varshney, Dennis Wei, Karthikeyan Natesan Ramamurthy, and Aleksandra Mojsilović. *ACM Journal of Data and Information Quality*, vol. 6, no. 2–3, p. 5, June 2015.

Targeting Villages for Rural Development Using Satellite Image Analysis. Kush R. Varshney, George H. Chen, Brian Abelson, Kendall Nowocin, Vivek Sakhrani, Ling Xu, and Brian L. Spatocco. *Big Data*, vol. 3, no. 1, p. 41–53, March 2015.

Optimal Grouping for Group Minimax Hypothesis Testing. Kush R. Varshney and Lav R. Varshney. *IEEE Transactions on Information Theory*, vol. 60, no. 10, p. 6511–6521, October 2014.

Bounded Confidence Opinion Dynamics in a Social Network of Bayesian Decision Makers. Kush R. Varshney. *IEEE Journal of Selected Topics in Signal Processing*, vol. 8, no. 4, p. 576–585, August 2014.

Collaborative Kalman Filtering for Dynamic Matrix Factorization. John Z. Sun, Dhruv Parthasarathy, and Kush R. Varshney. *IEEE Transactions on Signal Processing*, vol. 62, no. 14, p. 3499-3509, July 15, 2014.

Sparsity-Driven Synthetic Aperture Radar Imaging: Reconstruction, Autofocusing, Moving Targets, and Compressed Sensing. Müjdat Çetin, Ivana Stojanović, N. Özben Önhon, Kush R. Varshney, Sadegh Samadi, W. Clem Karl, and Alan S. Willsky. *IEEE Signal Processing Magazine*, vol. 31, no. 4, p. 27–40, July 2014.

Practical Ensemble Classification Error Bounds for Different Operating Points. Kush R. Varshney, Ryan J. Prenger, Tracy L. Marlatt, Barry Y. Chen, and William G. Hanley. *IEEE Transactions on Knowledge and Data Engineering*, vol. 25, no. 11, p. 2590–2601, November 2013.

Sales-Force Performance Analytics and Optimization. Moritz Baier, Jorge E. Carballo, Alice J. Chang, Yingdong Lu, Aleksandra Mojsilović, M. Jonathan Richard, Moninder Singh, Mark S. Squillante, and Kush R. Varshney. *IBM Journal of Research and Development*, vol. 56, no. 6, November/December 2012.

Generalization Error of Linear Discriminant Analysis in Spatially-Correlated Sensor Networks. Kush R. Varshney. *IEEE Transactions on Signal Processing*, vol. 60, no. 6, p. 3295-3301, June 2012.

Bayes Risk Error is a Bregman Divergence. Kush R. Varshney. *IEEE Transactions on Signal Processing*, vol. 59, no. 9, p. 4470–4472, September 2011.

Business Analytics Based on Financial Time Series. Kush R. Varshney and Aleksandra Mojsilović. *IEEE Signal Processing Magazine*, vol. 28, no. 5, p. 83–93, September 2011.

Linear Dimensionality Reduction for Margin-Based Classification: High-Dimensional Data and Sensor Networks. Kush R. Varshney and Alan S. Willsky. *IEEE Transactions on Signal Processing*, vol. 59, no. 6, p. 2496–2512, June 2011.

Classification Using Geometric Level Sets. Kush R. Varshney and Alan S. Willsky. *Journal of Machine Learning Research*, vol. 11, p. 491–516, February 2010.

Postarthroplasty Examination Using X-Ray Images. Kush R. Varshney, Nikos Paragios, Jean-François Deux, Alain Kulski, Rémy Raymond, Phillipe Hernigou, and Alain Rahmouni. *IEEE Transactions on Medical Imaging*, vol. 28, no. 3, p. 469–474, March 2009.

Quantization of Prior Probabilities for Hypothesis Testing. Kush R. Varshney and Lav R. Varshney. *IEEE Transactions on Signal Processing*, vol. 56, no. 10, p. 4553–4562, October 2008.

Sparse Representation in Structured Dictionaries with Application to Synthetic Aperture Radar. Kush R. Varshney, Müjdat Çetin, John W. Fisher, III, and Alan S. Willsky. *IEEE Transactions on Signal Processing*, vol. 56, no. 8, p. 3548–3561, August 2008.

Conference Papers

Deciding Fast and Slow: The Role of Cognitive Biases in AI-Assisted Decision-Making. Charvi Rastogi, Yunfeng Zhang, Dennis Wei, Kush R. Varshney, Amit Dhurandhar, and Richard Tomsett. *ACM Conference on Computer-Supported Cooperative Work and Social Computing*, November 2022.

Humble Machines: Attending to the Underappreciated Costs of Misplaced Distrust. Bran Knowles, Jason D'Cruz, John T. Richards, and Kush R. Varshney. *ACM Conference on Equity and Access in Algorithms, Mechanisms, and Optimization*, Arlington, VA, October 2022.

Differentially Private SGDA for Minimax Problems. Zhenhuan Yang, Shu Hu, Yunwen Lei, Kush R. Varshney, Siwei Lyu, and Yiming Ying. *Conference on Uncertainty in Artificial Intelligence*, Eindhoven, Netherlands, August 2022.

Causal Feature Selection for Algorithmic Fairness. Sainyam Galhotra, Karthikeyan Shanmugam, Prasanna Sattigeri, and Kush R. Varshney. *ACM SIGMOD/PODS International Conference on Management of Data*, Philadelphia, PA, June 2022.

Out-of-Distribution Detection in Dermatology using Input Perturbation and Subset Scanning. Hannah Kim, Girmaw Abebe Tadesse, Celia Cintas, Skyler Speakman, and Kush R. Varshney. *IEEE International Symposium on Biomedical Imaging*, Kolkata, India, March 2022.

AI Explainability 360: Impact and Design. Vijay Arya, Rachel K. E. Bellamy, Pin-Yu Chen, Amit Dhurandhar, Michael Hind, Samuel C. Hoffman, Stephanie Houde, Q. Vera Liao, Ronny Luss, Aleksandra Mojsilović, Sami Mourad, Pablo Pedemonte, Ramya Raghavendra, John T. Richards,

Prasanna Sattigeri, Karthikeyan Shanmugam, Moninder Singh, Kush R. Varshney, Dennis Wei and Yunfeng Zhang. *Conference on Innovative Applications of Artificial Intelligence*, February 2022.

Uncertainty Quantification 360. Soumya Ghosh, Q. Vera Liao, Karthikeyan Natesan Ramamurthy, Jiri Navratil, Prasanna Sattigeri, Kush R. Varshney, Yunfeng Zhang. *ACM India Joint International Conference on Data Science and Management of Data*, p. 333–335, January 2022.

CoFrNets: Interpretable Neural Architecture Inspired by Continued Fractions. Isha Puri, Amit Dhurandhar, Tejaswini Pedapati, Karthikeyan Shanmugam, Dennis Wei, and Kush R. Varshney. *Advances in Neural Information Processing Systems*, December 2021.

Blockchain and the Scientific Method. James A. Evans, Kweku Opoku-Agyemang, Krishna Ratakonda, Kush R. Varshney, and Lav R. Varshney. *ASCR Workshop on Cybersecurity and Privacy for Scientific Computing Ecosystems*, November 2021.

Out-of-Distribution Detection and Fairness Assessment in Dermatology. Hannah Kim, Girmaw Abebe Tadesse, Celia Cintas, Skyler Speakman, and Kush R. Varshney. *KDD Outlier Detection and Description Workshop*, August 2021.

An Empirical Study of Accuracy, Fairness, Explainability, Distributional Robustness, and Adversarial Robustness. Moninder Singh, Gevorg Ghalachyan, Kush R. Varshney, and Reginald E. Bryant. *KDD Workshop on Measures and Best Practices for Responsible AI*, August 2021.

A Research Framework for Understanding Education-Occupation Alignment with NLP Techniques. Renzhe Yu, Subhro Das, Sairam Gurajada, Kush R. Varshney, Hari Raghavan and Carlos X. Lastra-Anadon. *ACL-IJCNLP Workshop on NLP for Positive Impact*, August 2021.

Biomedical Interpretable Entity Representations. Diego Garcia-Olano, Yasumasa Onoe, Ioana Baldini, Joydeep Ghosh, Byron C. Wallace, and Kush R. Varshney. *Findings of ACL: ACL-IJCNLP*, August 2021.

Treatment Effect Estimation Using Invariant Risk Minimization. Abhin Shah, Kartik Ahuja, Karthikeyan Shanmugam, Dennis Wei, Kush R. Varshney, and Amit Dhurandhar. *IEEE International Conference on Acoustics, Speech, and Signal Processing*, p. 5005–5009, June 2021.

Beyond Reasonable Doubt: Improving Fairness in Budget-Constrained Decision Making Using Confidence Thresholds. Michiel Bakker, Duy Patrick Tu, Krishna Gummadi, Alex 'Sandy' Pentland, Kush R. Varshney, and Adrian Weller. *AAAI/ACM Conference on Artificial Intelligence, Ethics, and Society*, May 2021.

Towards Interpreting Zoonotic Potential of Betacoronavirus Sequences with Attention. Kahini Wadhawan, Payel Das, Barbara A. Han, Ilya R. Fischhoff, Adrian Castellanos, Arvind Varsani, and Kush R. Varshney. *ICLR Workshop on Machine Learning for Preventing and Combating Pandemics*, May 2021.

Fairly Estimating Socioeconomic Status Under Costly Feature Acquisition. Ritika Brahmadesam and Kush R. Varshney. *ICLR Workshop on Practical Machine Learning for Developing Countries*, May 2021.

Empirical or Invariant Risk Minimization? A Sample Complexity Perspective. Kartik Ahuja, Jun Wang, Amit Dhurandhar, Karthikeyan Shanmugam, and Kush R. Varshney. *International Conference on Learning Representations*, May 2021.

Automated Meta-Analysis in Medical Research: A Causal Learning Perspective. Lu Cheng, Dmitriy Katz-Rogozhnikov, Kush R. Varshney, and Ioana Baldini. *ACM Conference on Health, Inference, and Learning Workshop*, April 2021.

Disparate Impact Diminishes Consumer Trust Even for Advantaged Users. Tim Draws, Zoltán Szlávik, Benjamin Timmermans, Nava Tintarev, Kush R. Varshney, and Michael Hind. *International Conference on Persuasive Technologies*, April 2021.

Automated Evaluation of Representation in Dermatology Educational Materials. Girmaw Abebe Tadesse, Hannah Kim, Roxana Daneshjou, Celia Cintas, Kush R. Varshney, Ademide Adelekun, Jules Lipoff, Ginikanwa Onyekab, Veronica Rotemberg, and James Zou. *AAAI Workshop on Trustworthy AI for Healthcare*, February 2021.

Exploring the Efficacy of Generic Drugs in Treating Cancer. Ioana Baldini, Mariana Bernagozzi, Sulbha Aggarwal, Mihaela Bornea, Saksham Chawla, Joppe Geluykens, Dmitriy A. Katz-Rogozhnikov, Pratik Mukherjee, Smruthi Ramesh, Sara Rosenthal, Jagrati Sharma, Kush R. Varshney, Catherine Del Vecchio Fitz, Pradeep Mangalath, and Laura B. Kleiman. *AAAI Conference on Artificial Intelligence*, February 2021.

AI Explainability 360 Toolkit. Vijay Arya, Rachel K. E. Bellamy, Pin-Yu Chen, Amit Dhurandar, Michael Hind, Samuel C. Hoffman, Stephanie Houde, Q. Vera Liao, Ronny Luss, Aleksandra Mojsilović, Sami Mourad, Pablo Pedemonte, Ramya Raghavendra, John T. Richards, Prasanna Sattigeri, Karthikeyan Shanmugam, Moninder Singh, Kush R. Varshney, Dennis Wei, and Yunfeng Zhang. *ACM India Joint International Conference on Data Science and Management of Data*, p. 376–379, Bangalore, India, January 2021. (held virtually)

Identifying Factors Associated with Neonatal Mortality in Sub-Saharan Africa using Machine Learning. William Ogallo, Skyler Speakman, Victor Akinwande, Kush R. Varshney, Aisha Walcott-Bryant, Charity Wayua, Komminist Weldemariam, Claire-Helene Mershon, and Nosa Orobaton. *American Medical Informatics Association Annual Symposium*, Chicago, IL, November 2020. (held virtually)

Fairness of Classifiers Across Skin Tones in Dermatology. Newton M. Kinyanjui, Timothy Odonga, Celia Cintas, Noel C. F. Codella, Rameswar Panda, Prasanna Sattigeri, and Kush R. Varshney. *International Conference on Medical Image Computing and Computer Assisted Intervention*, Lima, Peru, October 2020. (held virtually)

Trust and Transparency in Contact Tracing Applications. Stacy Hobson, Michael Hind, Aleksandra Mojsilović, and Kush R. Varshney. *KDD Workshop on Fragile Earth: Data Science for a Sustainable Planet*, San Diego, CA, August 2020. (held virtually)

Tutorial on Human-Centered Explainability for Healthcare. Prithwish Chakraborty, Bum Chul Kwon, Sanjoy Dey, Amit Dhurandhar, Daniel Gruen, Kenney Ng, Daby Sow, and Kush R. Varshney. *ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*, p. 3547–3548, San Diego, CA, August 2020. (held virtually)

On the Equivalence of Bi-Level Optimization and Game-Theoretic Formulations of Invariant Risk Minimization. Kartik Ahuja, Karthikeyan Shanmugam, Kush R. Varshney, and Amit Dhurandhar. *ICML Workshop on Inductive Biases, Invariances and Generalization in RL*, Vienna, Austria, July 2020. (held virtually)

Invariant Risk Minimization Games. Kartik Ahuja, Karthikeyan Shanmugam, Kush R. Varshney, and Amit Dhurandhar. *International Conference on Machine Learning*, p. 145–155, Vienna, Austria, July 2020. (held virtually)

Is There a Trade-Off Between Fairness and Accuracy? A Perspective Using Mismatched Hypothesis Testing. Sanghamitra Dutta, Dennis Wei, Hazar Yueksel, Pin-Yu Chen, Sijia Liu, and Kush R. Varshney. *International Conference on Machine Learning*, p. 2803–2813, Vienna, Austria, July 2020. (held virtually)

Inspection of Blackbox Models for Evaluating Vulnerability in Maternal, Newborn, and Child Health. William Ogallo, Skyler Speakman, Victor Akinwande, Kush R. Varshney, Aisha Walcott-Bryant, Charity Wayua, and Komminist Weldemariam. *International Joint Conference on Artificial Intelligence–Pacific Rim International Conference on Artificial Intelligence*, p. 5282–5284, Yokohama, Japan, July 2020. (delayed and held virtually)

Characterization of Overlap in Observational Studies. Michael Oberst, Fredrik D. Johansson, Dennis Wei, Tian Gao, Gabriel Brat, David Sontag, and Kush R. Varshney. *International Conference on Artificial Intelligence and Statistics*, p. 788–798, Palermo, Italy, June 2020. (delayed and held virtually)

Preservation of Anomalous Subgroups on Variational Autoencoder Transformed Data. Samuel C. Maina, Reginald E. Bryant, William Ogallo, Kush R. Varshney, Skyler Speakman, Celia Cintas, Aisha Walcott-Bryant, Robert-Florian Samoilescu, and Komminist Weldemariam. *IEEE International Conference on Acoustics, Speech, and Signal Processing*, p. 3627–3631, Barcelona, Spain, May 2020. (held virtually)

DADI: Dynamic Discovery of Fair Information with Adversarial Reinforcement Learning. Michiel Bakker, Duy Patrick Tu, Humberto Riverón Valdés, Krishna Gummadi, Kush R. Varshney, Adrian Weller and Alex 'Sandy' Pentland. *ICLR Workshop on Towards Trustworthy ML*, Addis Ababa, Ethiopia, April 2020. (held virtually)

Experiences with Improving the Transparency of AI Models and Services. Michael Hind, Stephanie Houde, Jacquelyn Martino, Aleksandra Mojsilović, David Piorkowski, John Richards, and Kush R. Varshney. *ACM CHI Conference on Human Factors in Computing Systems*, p. LBW229, Honolulu, HI, April 2020. (held virtually)

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Tracking the Evolution of Topic Rankings from Contextual Data. Mary E. Helander, Hemank Lamba, Nizar Lethif, Joana S. B. T. Maria, Emily A. Ray, and Kush R. Varshney, US 11,244,013, February 8, 2022.

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Generating Semantic Flow Graphs Representing Computer Programs. Ioana M. Baldini Soares, Aleksandra Mojsilović, Evan J. Paterson, and Kush R. Varshney. US 10,628,282, April 21, 2020.

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Accelerating Data-Driven Scientific Discovery. Flavio P. Calmon and Kush R. Varshney. US 10,388,039, August 20, 2019.

Association-Based Product Design. Kush R. Varshney, Lav R. Varshney, and Jun Wang. US 10,019,689, July 10, 2018.

Computing Personalized Probabilistic Familiarity Based on Known Artifact Data. Florian Pinel, Nan Shao, Kush R. Varshney, and Lav R. Varshney. US 9,852,380, December 26, 2017.

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Applied

Interpretable Neural Architecture Using Continued Fractions. Amit Dhurandhar, Tejaswini Pedapati, Isha Puri, Karthikeyan Shanmugam, Kush R. Varshney, and Dennis Wei. 17/806,188, filed June 9, 2022.

Input-Encoding with Federated Learning. Pradip Bose, Supriyo Chakraborty, Brian E. D. Kingsbury, Kush R. Varshney, Augusto Vega, Dinesh C. Verma, Ashish Verma, Shiqiang Wang, and Hazar Yueksel. 17/239,812, filed April 26, 2021.

Learning Robust Predictors Using Game Theory. Kartik Ahuja, Amit Dhurandhar, Karthikeyan Shanmugam, and Kush R. Varshney. 17/115,489, filed December 8, 2020.

Initializing Optimization Solvers. Kartik Ahuja, Amit Dhurandhar, Karthikeyan Shanmugam, and Kush R. Varshney. 17/101,019, filed November 23, 2020.

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Modeling External Event Effects Upon System Variables. Debarun Bhattacharjya, Tian Gao, Nicholas S. Mattei, Karthikeyan Shanmugam, Dharmashankar Subramanian, and Kush R. Varshney. 16/942,842, filed July 30, 2020.

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Mitigating Statistical Bias in Artificial Intelligence Models. Rachel K. E. Bellamy, Kush R. Varshney, and Yunfeng Zhang. 16/745,872, filed January 17, 2020.

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Semantic Queries Based on Semantic Representation of Programs and Data Source Ontologies. Ioana M. Baldini Soares, Aleksandra Mojsilović, Evan J. Patterson, and Kush R. Varshney. 16/244,447, filed January 10, 2019.

System and Method for Post Hoc Improvement of Instance-Level and Group-Level Prediction Metrics. Manish Bhide, Pranay Lohia, Karthikeyan Natesan Ramamurthy, Ruchir Puri, Diptikalyan Saha, and Kush R. Varshney. 16/214,703, filed December 10, 2018.

Distributed Platform for Computation and Trusted Validation. Nelson Kibichii Bore, Michael Hind, Eleftheria K. Pissadaki, Ravi Kiran Raman, Sekou Lionel Remy, Roman Vaculin, and Kush R. Varshney. 16/135,438, filed September 19, 2018.

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Method for Market Risk Assessment for Healthcare Applications. Shilpa Mahatma, Aleksandra Mojsilović, Karthikeyan Natesan Ramamurthy, Kush R. Varshney, Dennis Wei, and Gigi Yuen-Reed. 14/699,482, filed April 29, 2015.

Nonparametric Tracking and Forecasting of Multivariate Data. Aleksandr Y. Aravkin, Dmitry M. Malioutov, and Kush R. Varshney. 14/480,704, filed September 9, 2014, abandoned July 24, 2018.

Tutorials, Talks, Panels, and Demonstrations:

Tutorials

AI Fairness 360.

- Immersive AI Session, Open Data Science Conference, New York, NY, June 27, 2019.
- O'Reilly Artificial Intelligence Conference, New York, NY, April 16, 2019.
- ACM Conference on Fairness, Accountability, and Transparency, Atlanta, GA, January 29, 2019.

Artificial Intelligence and Machine Learning.

- United Nations Data Innovation Lab, Nairobi, Kenya, March 13, 2017.

Introduction to Business Analytics.

- IEEE International Conference on Acoustics, Speech, and Signal Processing, Kyoto, Japan, March 25, 2012.

Invited Talks

Trustworthy Machine Learning.

- *Keynote*, IEEE International Workshop on Machine Learning for Signal Processing, August 24, 2022.
- Jour-Fixe Talk, Prosus AI, June 30, 2022.
- QuantUniversity, March 29, 2022.

Precautionary Human and Machine Decision Making, and Humble Trust.

- Data Science Institute, Lancaster University, June 22, 2022.

A Carative Approach to AI Governance.

- AI COI and AIME Joint Seminar on Artificial Intelligence and Machine Learning, National Institute of Standards and Technology, May 3, 2022.
- *Keynote*, ICLR Workshop on Practical ML for Developing Countries, April 29, 2022.
- Institute for Assured Autonomy, Johns Hopkins University, April 19, 2022.

Interpretable Machine Learning for Safety and Teaming

- Interpretability in Artificial Intelligence (22w5055), Banff International Research Station for Mathematical Innovation and Discovery, May 3, 2022.

A Unified View of Trustworthy AI with the 360 Toolkits

- *Keynote,* Open Data Science Conference East, Boston, MA, April 21, 2022.

AI Fairness 360.

- Fraunhofer Institut für Arbeitswirtschaft und Organisation, April 12, 2022.
- Reinforce AI Conference, Budapest, Hungary, March 22, 2019.
- Budapest Data Science Meetup, Budapest, Hungary, March 20, 2019.

- Cognitive Systems Institute Group Speaker Series Webinar, September 20, 2018.

How Can Universities Collaborate with External Organizations and Local Communities to Address Questions of Bias and Discrimination in AI Enabled Technologies?

- Symposium on Artificial Intelligence and Social Responsibility, Coordinated Science Laboratory, University of Illinois at Urbana-Champaign, Urbana, IL, March 23, 2022.

A Perspective on AI Governance.

- Annual Winter Workshop, Department of Statistics, University of Florida, January 15, 2022.
- Responsible AI Systems and Experiences Seminar, University of Washington, December 3, 2021.

Results in Trustworthy Machine Learning That Go Against Conventional Wisdom.

- *Keynote*, WACV Workshop on Demographic Variations in Performance of Biometrics and Related Technology, January 8, 2022.
- *Keynote*, IJCAI International Workshop on Mining Actionable Insights from Social Networks, August 21, 2021.
- Computation and Society Initiative Colloquium, Yale University, New Haven, CT, February 21, 2020.

Characterizing Threats to Validity in Trustworthy Machine Learning Using Information Theory.

- *Keynote*, ICML Workshop on Information-Theoretic Methods for Rigorous, Responsible, and Reliable Machine Learning, July 24, 2021.

Artificial Intelligence, Data Science, and Global Pandemics.

- Summer Undergraduate Research Program, New York University, July 12, 2021.
- Artificial Intelligence Summit, School of Informatics and Telecommunications, Duoc UC, Santiago, Chile, June 1, 2021. (held virtually)
- COVID-19 Policy Discussion Series, Cornell Institute for Public Affairs, May 28, 2020.

AI Safety in Cyber-Physical Systems, Decision Sciences, and Data Products.

- International Workshop on Signal and Information Intelligent Learning and Processing, Xi'an, China, July 11, 2021. (held virtually)
- QuantPort, New York, NY, September 13, 2018.
- Inside the Black Box Conference, New York, NY, June 16, 2018.
- Uehiro-Carnegie-Oxford Ethics Conference, New York, NY, May 17, 2018.

Lessons from Bottom of the Pyramid Innovation for AI for Social Good

- Catalyst Tech Start-Up Accelerator Talk, Oxford Brookes University, July 5, 2021.
- Center for Research for Computation and Society, Harvard University, March 29, 2021.

Developing Trust in Artificial Intelligence and Machine Learning for High-Stakes Applications.

- Goergen Institute for Data Science, University of Rochester, June 23, 2021.
- *Keynote Address*, Enterprise Computing Community Conference, June 14, 2021.
- Kaiser Permanente DS&E Invited Talk Series, May 21, 2021.
- IBM presents: What's next in AI? Webinar Series, May 19, 2021.
- *Keynote Address*, IEEE Green Mountain Section Annual Meeting, Burlington, VT, November 20, 2020. (held virtually)
- International Workshop on Signal and Information Intelligent Learning and Processing, Xi'an, China, August 15, 2020. (held virtually)

- Mind Food Talk, Ajua (formerly mSurvey), Nairobi, Kenya, September 27, 2019.
- Carnegie Mellon University Africa, Kigali, Rwanda, September 19, 2019.
- *Keynote Address*, IEEE Syracuse Section Fellows Night, Syracuse, NY, April 11, 2019.
- Electrical Engineering and Computer Science Seminar, Syracuse University, Syracuse, NY, April 10, 2019.
- Princeton University, Princeton, NJ, March 8, 2019.
- Electrical and Computer Engineering Seminar, University of Virginia, Charlottesville, VA, October 19, 2018.
- New York Artificial Intelligence Meetup, New York, NY, September 27, 2018.

Computational Intelligence, Creativity, and Wisdom for Man and Mankind.
- IDInsight, Nairobi, Kenya, October 30, 2019.
- New England Complex Systems Institute Winter School, Cambridge, MA, January 11, 2018.

Unequal Performance Across Groups in Face Image Classification.
- SAMSI Discussion Series on Controversial Topics in Machine Learning and Precision Medicine, Research Triangle Park, NC, February 27, 2019.

On Making Machine Learning Safe.
- PDT Partners, New York, NY, June 8, 2017.
- IEEE International Conference on Signal Processing and Integrated Networks, Noida, India, February 3, 2017.
- Computer Science Colloquium, University at Albany, Albany, NY, November 7, 2016.
- *Keynote Lecture*, INFORMS Southeast Michigan Symposium, Rochester, MI, May 14, 2016.

Data for Good.
- School of Social Policy and Practice, University of Pennsylvania, Philadelphia, PA, March 30, 2017.

Learning Classification Rules via Boolean Compressed Sensing with Application to Workforce Analytics.
- Optimization Seminar, Department of Operations Research and Financial Engineering, Princeton University, Princeton, NJ, January 22, 2015.
- Communications Seminar, Coordinated Science Laboratory, University of Illinois at Urbana-Champaign, Urbana, IL, November 3, 2014.
- Interdisciplinary Distinguished Seminar Series, Department of Electrical and Computer Engineering, North Carolina State University, Raleigh, NC, October 4, 2013.

Detecting Poverty with Satellite Imagery.
- Nielsen Machine Learning Webinar, December 16, 2016.
- *Keynote Address*, Big Data Summit, University of Illinois Research Park, Champaign, IL, November 5, 2014.
- Data Analysts for Social Good Webinar, October 9, 2014.

Proactive Retention among IBM Growth Market Employees.
- Using Analytics to Optimize Your Workforce Seminar, Analytics Solutions Center, Washington, DC, March 12, 2013.

Margin-Based Classification and Dimensionality Reduction Using Geometric Level Sets.
- École Centrale Paris, Châtenay-Malabry, France, July 1, 2011.

- General Electric Global Research Center, Niskayuna, NY, January 21, 2010.
- MITRE Corporation, Bedford, MA, January 14, 2010.
- NASA Jet Propulsion Laboratory, Pasadena, CA, December 10, 2009.
- MIT Lincoln Laboratory, Lexington, MA, November 24, 2009.
- IBM Thomas J. Watson Research Center, Yorktown Heights, NY, November 16, 2009.
- Naval Research Laboratory, Washington, DC, November 10, 2009.
- National Institute of Standards and Technology, Gaithersburg, MD, November 9, 2009.
- Information, Systems and Networks Seminar, Cornell University, Ithaca, NY, November 6, 2009.
- Schlumberger-Doll Research Center, Cambridge, MA, November 2, 2009.

Supervised Classification in Sensor Networks.

- Communications, Networking, Signal and Image Processing Seminar, Purdue University, West Lafayette, IN, October 6, 2010.
- Business Analytics and Mathematical Sciences Department Seminar, IBM Thomas J. Watson Research Center, Yorktown Heights, NY, October 4, 2010.

Frugal Hypothesis Testing and Classification.

- Massachusetts Institute of Technology, Cambridge, MA, February 8, 2010.

Level Set Margin-Based Classification.

- National Security Engineering Division Seminar, Lawrence Livermore National Laboratory, Livermore, CA, August 11, 2009.
- Decision Modeling Research Initiative Seminar, MIT Lincoln Laboratory, Lexington, MA, January 16, 2009.
- Johns Hopkins University Applied Physics Laboratory, Laurel, MD, January 13, 2009.

Wide-Angle SAR Image Formation with Sparsifying Regularization.

- Decision Modeling Research Initiative Seminar, MIT Lincoln Laboratory, Lexington, MA, January 30, 2007.
- Dipartimento di Ingegneria dell'Informazione, Facoltà di Ingegneria, Università di Pisa, Italy, July 17, 2006.

Panels

Panelist, Context is Everything: Requirements for Test, Evaluation, Validation and Verification (TEVV), Building the NIST AI Risk Management Framework: Workshop #2, March 31, 2022.

Panelist, Building a Career in AI/ML, New York University AI School, January 11, 2022.

Panelist, Bias, Fairness, and Ethics in Biometrics, WACV Workshop on Demographic Variations in Performance of Biometrics and Related Technology, January 8, 2022.

Panelist, AI + Dermatology, AI + Health Conference, Stanford University, December 8, 2021.

Panelist, Interdisciplinary Research in Trustworthy ML -- Challenges and Way Forward, The Invisible Elephant in the Room: The Trustworthy ML Un-Symposium, October 28, 2021.

Moderator, Trustworthy AI and Lending, Ethics and Explainability for Responsible Data Science Workshop, University of Johannesburg, October 27, 2021.

Panelist, Technical Characteristics of AI System Trustworthiness, NIST AI Risk Management Framework Workshop, October 20, 2021.

Panelist, KDD Workshop on Measures and Best Practices for Responsible AI, August 15, 2021.

Panelist, ICML Workshop on Information-Theoretic Methods for Rigorous, Responsible, and Reliable Machine Learning, July 24, 2021.

Panelist, Deployment & Impact of AI for Social Good, CMU Symposium on Artificial Intelligence for Social Good, April 30, 2021.

Panelist, Algorithmic Fairness and Social Justice, Ingram Olkin Forum Series, National Institute of Statistical Sciences, September 25, 2020.

Panelist, Algorithmic Bias is in the Question, Not the Answer: Measuring and Managing Bias Beyond Data, NIST Bias in AI Workshop, August 18, 2020.

Panelist, Model Explainability Forum, TWIML AI Podcast, August 11, 2020.

Panelist, Data Privacy and Ethics, Yale Economic Development Symposium, New Haven, CT, February 21, 2020.

Moderator, AI for Social Good, Yale Economic Development Symposium, New Haven, CT, February 21, 2020.

Panelist, AAAI Artificial Intelligence Diversity, Belonging, Equity, and Inclusion Workshop, New York, NY, February 7, 2020.

Panelist, NetHope Workshop, AI for Good Global Summit, Geneva, Switzerland, May 31, 2019.

Panelist, Data and Partnerships, AI XPRIZE Team and Red Judge Summit, Geneva, Switzerland, May 31, 2019.

Panelist, 'Living with AI' Future Trends Forum, Fundación Innovación Bankinter, Madrid, Spain, May 28–30, 2019.

Panelist, Internet Policy Revolution, AI and Transparency, IBM IT Services Legal Summit, New York, NY, October 15, 2018.

Panelist, SDGs and Beyond: Leveraging Technology for Development, The Youth Assembly, New York, NY, August 12, 2018.

Moderator, Machine Learning that Matters Now, Stockholm, Sweden, July 14, 2018.

Panelist, Ethics and Fairness in Artificial Intelligence Think Tank, IBM Think, Las Vegas, NV, March 22, 2018.

Panelist, IBM Watson Health Opioid Summit, Cambridge, MA, January 17, 2018.

Panelist, Human Interpretability in Machine Learning, Sydney, Australia, August 10, 2017.

Moderator, Rapid-Fire Introduction to Data Science for Social Good Organizations and Opportunities, New York, NY, June 24, 2016.

Panelist, Stories from the Frontlines of Data Science for Good, New York, NY, October 27, 2015.

Panelist, IEEE Spectrum Forecasters Panel, 2013–2015.

Demonstrations
Automatic Generation of Factsheets for Trusted AI in a Runtime Environment.
- NeurIPS Expo, Montreal, Canada, December 2, 2018.

SellerScope: Interactive Salesforce Analytics.
- IBM Information on Demand EXPO, Las Vegas, NV, October 21–24, 2012.
- IBM Investor Briefing, Yorktown Heights, NY, May 9, 2012.
- IBM Innovation Lab, Lotusphere, Orlando, FL, January 15–19, 2012.

Teaching and Mentoring Experience:

Doctoral committee member
- Lu Cheng, *Arizona State University*
- Sanghamitra Dutta, *Carnegie Mellon University*
- Shubham Sharma, *University of Texas*

Mentor
- Gevorg Ghalachyan, M.S. candidate, *Yerevan State University*, Trustworthy AI Pentathlon, Summer–Fall 2019.
- Peter Yefi, M.S. candidate, *Carnegie Mellon University – Africa*, Trustworthy AI Pentathlon, Summer 2019.
- Timothy Odonga, M.S. candidate, *Carnegie Mellon University – Africa*, Fairness in Dermatology, Summer 2019.
- Newton Kinyanjui, M.S. candidate, *Carnegie Mellon University – Africa,* Fairness in Dermatology, Summer 2019.
- Shubham Sharma, Ph.D. candidate, *University of Texas*, Eliciting Fairness Definitions from Policymakers, Summer 2019.
- Sanghamitra Dutta, Ph.D. candidate, *Carnegie Mellon University*, Detection Theory-Based Analysis of Accuracy, Fairness, and Explainability, Summer 2019.
- Shivashankar Subramanian, Ph.D. candidate, *University of Melbourne*, Extracting Evidence of Drug Repurposing from Scientific Papers, Summer 2019.
- Akanksha Atrey, Ph.D. candidate, *University of Massachusetts*, Causal Inference to Address the Opioid Crisis, Summer 2019.
- Vivek Gupta, Ph.D. candidate, *University of Utah*, Contrastive Explanations for Natural Language Processing, Summer 2019.
- Xiufan Yu, Ph.D. candidate, *Pennsylvania State University*, Optimal Pathways out of Poverty, Summer 2019.
- Oscar Chang, Ph.D. candidate, *Columbia University*, Creating New Antibiotics of Last Resort, Summer–Fall 2018.
- Amanda Coston, Ph.D. candidate, *Carnegie Mellon University*, Fair Financial Inclusion and Transfer Learning, Summer 2018.

- Niccolò Dalmasso, Ph.D. candidate, *Carnegie Mellon University*, Pruning Neural Networks for Multiple Objectives, Summer 2018.
- Vidya Muthukumar, Ph.D. candidate, *University of California, Berkeley*, Color Blind Neural Networks, Summer 2018.
- Chirag Nagpal, Ph.D. candidate, *Carnegie Mellon University*, Causal Inference to Address the Opioid Crisis, Summer 2018.
- Ritesh Noothigattu, Ph.D. candidate, *Carnegie Mellon University*, Winning Video Games Morally, Summer 2018.
- Ravi Kiran Raman, Ph.D. candidate, *University of Illinois*, Trusted Models and Results, Summer 2018. (Now with Analog Garage.)
- Evan Patterson, Ph.D. candidate, *Stanford University*, Open Discovery Platform for a Multiple Sclerosis Cure and Semantic Understanding of Data Science Code, Summer 2016; Summer 2017–Spring 2018.
- Tejas Dharamsi, M.S. candidate, *Columbia University*, Neurology-as-a-Service for the Developing World, Fall 2017. (Now with Trifacta.)
- Jonathan Galsurkar, M.S. candidate, *Columbia University*, Smarter Sustainable Development, Summer–Fall 2017. (Now with Capital One.)
- Anand Doshi, M.S. candidate, *University of Michigan*, Emergency Food Best Practice, Summer 2017. (Now with Plenty.)
- Aditya Garg, M.S. candidate, *Columbia University*, Demystifying Social Entrepreneurship, Summer 2017. (Now with Tesla.)
- Bernat Guillén Pegueroles, Ph.D. candidate, *Princeton University*, Cognitive Policy Advisor, Summer 2017. (Now with Google.)
- Yaoli Mao, Ph.D. candidate, *Columbia University*, User Experience of Open Discovery Platforms, Summer 2017.
- Bryce Melvin, B.S. candidate, *University of Colorado*, Changing Behaviors to Conserve Energy, Summer 2017. (Now with DreamWorks Animation.)
- Timothy NeCamp, Ph.D. candidate, *University of Michigan*, Cognitive Disease Hunter, Summer 2017.
- Minh Nguyen, Ph.D. candidate, *University of Southern California*, SimplerVoice: Overcoming Illiteracy, Summer 2017.
- Hrishikesh Rao, Ph.D. candidate, *University of Michigan*, Emergency Food Best Practice, Summer 2017.
- Jinghe Zhang, Ph.D. candidate, *University of Virginia*, Combating the Opioid Crisis, Summer 2017. (Now with Target.)
- Wenyu (Wendy) Zhang, Ph.D. candidate, *Cornell University*, Cognitive Financial Advisor for Low-Wage Workers, Summer 2017.
- Yuanshuo (David) Zhao, Ph.D. candidate, *Georgia Institute of Technology*, Ask Nature for Design Inspiration, Summer 2017. (Now with Uber.)
- Caitlin Kuhlman, Ph.D. candidate, *Worcester Polytechnic Institute*, How to Foster Innovation, Summer 2016.
- Hemank Lamba, Ph.D. candidate, *Carnegie Mellon University*, Understanding the Ecospace of Philanthropic Projects, Summer 2016.
- Subhabrata Majumdar, Ph.D. candidate, *University of Minnesota*, Hunting Zika with Machine Learning, Summer 2016. (Now with AT&T Labs Research.)
- Kien Pham, Ph.D. candidate, *New York University*, Real-Time Understanding of Humanitarian Crises, Summer 2016. (Now with Facebook.)
- Yumeng Tao, Ph.D. candidate, *University of California Irvine*, Disseminating the Best Treatment for Diarrhea, Summer 2016. (Now with Facebook.)

- Guolong Su, Ph.D. candidate, *Massachusetts Institute of Technology*, Interpretable Two-Level Rule Learning, Summer 2015. (Now with Google.)
- Michael Wattendorf, B.S. candidate, *Princeton University*, Predicting Outcomes of Individual Tennis Points, Spring 2015–Spring 2016. (Now with Waymo.)
- Ben Quazzo, B.S. candidate, *Princeton University*, Statistical Analysis of Professional Tennis, Spring 2015. (Now with Accel Partners.)
- Shaobo Han, Ph.D. candidate, *Duke University,* Nonparametric Bayesian Modeling of Legislation for Exploratory Analysis, Summer 2014. (Now with NEC Laboratories America.)
- Jinfeng Yi, Ph.D. candidate, *Michigan State University*, Expertise Assessment Recommendation, Summer 2013. (Now with JD AI Research.)
- Alex Gittens, Ph.D. candidate, *California Institute of Technology*, Voluntary Attrition Modeling, Summer 2012. (Now with Rensselaer Polytechnic Institute.)
- Gautam K. Bhat, M.Sc. candidate, *Karnataka State Open University*, Deconvolving the Productivity of Salespeople, Fall 2011–Summer 2012. (Now with IBM Global Technology Services.)
- John Z. Sun, Ph.D. candidate, *Massachusetts Institute of Technology*, Dynamic Matrix Factorization and Collaborative Filtering based on the Kalman Filter, Summer 2011. (Now with PDT Partners.)
- Ankan Saha, Ph.D. candidate, *University of Chicago*, Semi-Supervised Multi-Task Learning with Task-Dependent Regularization, Summer 2010. (Now with LinkedIn.)

Adjunct project advisor, DS-GA 1003 Machine Learning and Computational Statistics, *New York University*, Spring 2015, Spring 2016.

Guest lecturer

- PADM 5472 Leveraging Information Technology for Public and Nonprofit Management, *Cornell University*, Spring 2019, Spring 2020, Spring 2021, Spring 2022.
- LAW 644 National Security Lawyering, *Syracuse University*, Spring 2022.
- PADM-GP 4322 Data and AI Strategies for Social Impact Organizations, *New York University*, Spring 2022.
- CIS 731 Artificial Neural Networks, *Syracuse University*, Fall 2020.
- HON 137 Honors Seminar: Understanding Algorithmic Bias, *State University of New York at Plattsburgh*, Fall 2020.
- MSFS 709 Tech4Development: Applying Technology to Sustainability Challenges, *Georgetown University*, Fall 2020.
- INFO-UB 0001 Information Technology in Business and Society, *New York University*, Spring 2019.
- CS-GY 9223 Foundations of Data Science, *New York University*, Spring 2016.
- 01:090:101 Data: What is it Good For? (Absolutely Something), *Rutgers University*, Fall 2015.
- ORF 360 Decision Modeling in Business Analytics, *Princeton University*, Spring 2015.

Teaching assistant, 6.972 Algorithms for Estimation and Inference, *Massachusetts Institute of Technology*, Fall 2006.

Group tutor, ECE 310 Introduction to Probability and Random Phenomena, *Cornell University*, Spring 2004.

Guest instructor, How Television Works, *Tompkins Seneca Tioga BOCES Community (alternative) School*, Spring 2004.

Service and Professional Activities:

Founding co-director: IBM Science for Social Good initiative, since 2015.

Board of directors: CriticaLink, since 2016.

Data ambassador: DataKind, Brooklyn, NY, USA, since August 2013.

Advisor: ALCF Concept to Clinic Lung Cancer Early Detection Challenge Hosted by DrivenData, 2017.

Professional societies: IEEE, since 2000 (senior member since 2015); ACM, 2013–2016; INFORMS, 2012; ISIF, 2009–2011; SIAM, 2006–2010; SPIE, 2006–2007; IEE/IET, 2005–2006.

Elected professional committees and working groups: Partnership on AI Working Group on Safety-Critical AI, since 2018; IEEE Signal Processing Theory and Methods Technical Committee, 2015–2017; IEEE Machine Learning for Signal Processing Technical Committee, 2014–2016.

Journal editorial board: Journal of Machine Learning Research, since 2020; Digital Signal Processing: A Review Journal, 2013–2016.

Proposal review panel: Directorate for Computer and Information Science and Engineering, National Science Foundation, 2019.

Workshop and symposium organizer: 2021 INFORMS Annual Meeting Session on Participatory Specification of Trustworthy Machine Learning; 2020–2021 IEEE CVPR Workshop on Fair, Data Efficient and Trusted Computer Vision; 2016–2018, 2020 ICML Workshop on Human Interpretability (WHI) in Machine Learning; 2019 ICML Workshop on Human in the Loop Learning (HILL); 2019 AAAS Annual Meeting Symposium on Blockchain and the Scientific Method; 2017 IEEE GlobalSIP Symposium on Signal and Information Processing for Finance and Business; 2017 ACM SIGKDD Workshop on Machine Learning for Creativity; 2016 ICML Workshop on #data4good: Machine Learning in Social Good Applications.

Track chair: ACM Conference on Fairness, Accountability and Transparency (FAT*), 2020.

Journal reviewer: ACM Transactions on Interactive Intelligent Systems; Computer Methods in Biomechanics and Biomedical Engineering; Computers in Human Behavior; Data Mining and Knowledge Discovery; Digital Signal Processing (2 articles); Electronic Journal of Statistics; Entropy; Future Business Journal; IBM Journal of Research and Development (2 articles); IEE Proceedings Vision, Image and Signal Processing; IEEE Geoscience and Remote Sensing Letters; IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing; IEEE Journal of Selected Topics in Signal Processing (5 articles); IEEE Potentials Magazine (several articles); IEEE Signal Processing Letters (5 articles); IEEE Signal Processing Magazine (3 articles); IEEE Transactions on Aerospace and Electronic Systems; IEEE Transactions on Communications; IEEE Transactions on Cybernetics; IEEE Transactions on Image Processing (2 articles); IEEE Transactions on Multimedia; IEEE Transactions on Information Theory (2 articles); IEEE Transactions on Signal Processing (9 articles); Information Sciences; Inverse Problems and Imaging; Journal of Artificial Intelligence Research; Journal of Machine Learning Research (7 articles); Nature Machine Intelligence (2 articles); Pattern Recognition; Remote Sensing Letters; Service Science (2 articles); Signal Processing (2 articles); Socio-Economic Planning Sciences; Stochastic Models; Technology in Society.

Conference program committee and reviewer: Conference on Neural Information Processing Systems, 2016–2018, 2020, 2021–2022 (ethics reviewer); ACM Conference on Fairness, Accountability and Transparency, 2019, 2021–2022; ICLR Workshop on Practical ML for Developing Countries, 2020–2022; IEEE International Symposium on Information Theory, 2014, 2022; AAAI Workshop on Interactive Machine Learning, 2022; NeurIPS Workshop on Algorithmic Fairness through the Lens of Causality and Interpretability, 2020; IEEE International Conference on Acoustics, Speech, and Signal Processing, 2014–2017, 2019–2020; NeurIPS Workshop on Machine Learning for Development, 2019; KDD Workshop on Adversarial Learning Methods for Machine Learning and Data Mining, 2019; IEEE/IFIP DSN Workshop on Dependable and Secure Machine Learning, 2018–2019; ICLR Workshop on Debugging Machine Learning Models, 2019; ICLR Workshop on Safe Machine Learning: Specification, Robustness, and Assurance, 2019; International Conference on Artificial Intelligence and Statistics, 2019; ACM SIGCAS Conference on Computing and Sustainable Societies, 2018; ACM SIGKDD Conference on Knowledge Discovery and Data Mining, 2015–2018; International Conference on Machine Learning, 2012–2014, 2018; International Conference on Learning Representations, 2018; IEEE ICDM Workshop on Data Science for Human Capital Management, 2017; IEEE International Workshop on Machine Learning for Signal Processing, 2014–2017; IEEE International Conference on Intelligent Transportation Systems, 2017; International Conference on Signal Processing and Integrated Networks, 2015–2017; NIPS Workshop on Interpretable Machine Learning in Complex Systems, 2016; IEEE International Workshop on Statistical Signal Processing, 2012, 2016; Workshop on Compressed Sensing Theory and its Applications to Radar, Sonar and Remote Sensing, 2015; IEEE Sensor Array and Multichannel Signal Processing Workshop, 2014; IEEE International Conference on Service Operations and Logistics, and Informatics, 2013; IEEE GlobalSIP Symposium on Signal and Information Processing in Finance and Economics, 2013; European Signal Processing Conference, 2009, 2012; IEEE International Workshop on Statistical Signal Processing, 2011; International Conference on Industrial, Engineering, and Other Applications of Applied Intelligent Systems, 2011.

Book proposal reviewer: Springer Nature, 2022; MIT Press, 2021; Manning Publications, 2020.

Conference session chair: IEEE International Workshop on Machine Learning for Signal Processing, 2016; IEEE International Workshop on Statistical Signal Processing, 2012; INFORMS Annual Meeting, 2011.

Writer: Information Ashvins Blog (http://informationashvins.wordpress.com), since 2010; LIDS-Blog (http://lidsblog.typepad.com), 2007–2010.

Technical advisor, Fighter Steel Productions LLC, 2018.

Network member, *Council for Big Data, Ethics, and Society*, January–June 2016.

Organizing committee member, *Ebola Open Data Jam*, October 2014 and February 2015.

Summer intern coordinator, *Business Analytics and Mathematical Sciences Department*, IBM Thomas J. Watson Research Center, May–October 2013.

Organizing committee chair, *Stochastic Systems Symposium in Honor of Alan Willsky on the Occasion of his Sixtieth Birthday*, May 2008.

Organizer, *Stochastic Systems Group Seminars*, Fall 2007–Spring 2008.

Executive committee member, *MIT EECS Graduate Students Association*, 2006–2007.

Conference committee member, *LIDS Student Conference*, January 2005 and 2006.

Selected Coursework:

IBM Research: Technical Leadership; MicroMBA Program I & II.

Massive Open Online Courses: Quantitative Methods in Clinical and Public Health Research (HarvardX); The Challenges of Global Poverty (MITx).

Massachusetts Institute of Technology: Detection, Estimation, and Stochastic Processes; Discrete-Time Signal Processing; Optimization Methods; Machine Learning (listener); Representation and Modeling for Image Analysis; Computational Biology: Genomes, Networks, Evolution; Language and Its Structure II: Syntax; Language and Its Structure III: Semantics and Pragmatics.

Cornell University: Introduction to Computer Graphics; Signal Representation and Modeling; Digital Signal Processing; Telecommunications Systems I & II; Introduction to Scientific Computation; Geographic Information Systems; Introduction to Scanning Electron Microscopy; Computer Organization.

References:

Available upon request.