

Lav R. Varshney

varshney@illinois.edu

314 Coordinated Science Laboratory, University of Illinois at Urbana-Champaign, Urbana, IL 61801
<http://www.varshney.csl.illinois.edu/>

Academic Positions

University of Illinois at Urbana-Champaign

Associate Professor Aug. 2020–present

Department of Electrical and Computer Engineering
Coordinated Science Laboratory
Department of Computer Science (by courtesy)
Department of Industrial and Enterprise Systems Engineering (by courtesy)
Center for Digital Agriculture (by courtesy)
Beckman Institute for Advanced Science and Technology
Neuroscience Program

Assistant Professor Jan. 2014–Aug. 2020

Department of Electrical and Computer Engineering
Coordinated Science Laboratory
Department of Computer Science (by courtesy)
Department of Industrial and Enterprise Systems Engineering (by courtesy)
Center for Digital Agriculture (by courtesy)
Beckman Institute for Advanced Science and Technology
Neuroscience Program

Disruption Fellow Aug. 2019–Aug. 2020

Gies College of Business

Industrial and Entrepreneurial Positions

Enсарas, Inc. Jan. 2017–present

Chief Scientist

Salesforce Research AI July 2019–Aug. 2020

Principal Research Scientist, AI Ethics / AI for Social Good

IBM Thomas J. Watson Research Center Sept. 2010–Dec. 2013

Research Staff Member

Services Research

Education

Massachusetts Institute of Technology, Cambridge, Massachusetts, USA

• *Ph.D. in Electrical Engineering and Computer Science, June 2010*

(JIN-AU KONG THESIS AWARD HONORABLE MENTION)

Thesis: Unreliable and Resource-Constrained Decoding

Committee: Vivek K Goyal, Sanjoy K. Mitter, G. David Forney, Jr., and Vladimir M. Stojanovic

Minor: Science, Technology, Society, and Public Policy

• *Electrical Engineer, September 2008*

• *S.M. in Electrical Engineering and Computer Science, June 2006*

(ERNST A. GUILLEMIN THESIS AWARD)

Thesis: Information Storage: Nonsequential Sources and Neural Channels

Advisors: Sanjoy K. Mitter and Vivek K Goyal

Cornell University, Ithaca, New York, USA

• *B.S. in Electrical and Computer Engineering, May 2004*

(MAGNA CUM LAUDE, WITH HONORS)

Project: A Distributed Transmitter for Sensor Reachback Communication using Radar Signals

Advisor: Sergio D. Servetto

Minor: Information Science

Research Interests

My research focuses on the science and engineering of informational systems involving humans and machines. It is driven by a desire to improve individual and collective intelligence in modern environments.

This focus leads to specific research questions in:

information and coding theory • artificial intelligence • data science • statistical signal processing • neuroscience • creativity • history and social studies of engineering

Selected Awards and Honors

Teaching

- List of Teachers Ranked as Excellent, University of Illinois, Spring 2018
- List of Teachers Ranked as Excellent, University of Illinois, Spring 2017

Academic / Research

- Best Proposal on Human Longevity, Interstellar Initiative [AMED and NYAS], 2020
- Disruption Fellowship, Gies College of Business, University of Illinois, AY 2019-2020
- 2018 LIFT Intelligent Water Systems Challenge, second place
- Center for Advanced Study Fellow, University of Illinois, AY 2018-2019
- Selected Participant at National Academy's 2017 Arab-American Frontiers of Science, Engineering, and Medicine Symposium
- Bell Labs Prize, Finalist, 2016
- NYC Media Lab - Bloomberg Data for Good Exchange Paper Award, 2015
- Paper selected for anthology, *The Best Writing on Mathematics 2014* (Princeton University Press)
- Bell Labs Prize, Finalist, 2014
- IBM Faculty Award, 2014
- Selected Participant at National Academy of Engineering's 2014 Indo-American Frontiers of Engineering Symposium
- Best Paper Award (Cross-Enterprise Collaboration), SRII Global Conference, 2012
- Jin-Au Kong Thesis Award Honorable Mention (MIT electrical engineering doctoral thesis), 2011
- Ernst A. Guillemin Thesis Award (best MIT electrical engineering S.M. thesis), 2006
- National Science Foundation Graduate Research Fellowship, 2004-2008
- Capocelli Prize (best student paper), IEEE Data Compression Conference, 2006
- IEEE Student History Paper Contest Winner (Region 1), 2004
- Best Student Paper Award, IEEE Radar Conference, 2003
- Tau Beta Pi (engineering honor society), inducted 2003
- Eta Kappa Nu (electrical and computer engineering honor society), inducted 2003
- Tau Beta Pi/SAE Scholarship, 2000
- New York State Society of Professional Engineers Scholastic Achievement Award, 2000
- New York State Scholarship for Academic Achievement, 2000
- Walter & Cecile Borchert Scholarship, 2000

Entrepreneurial

- Microsoft AI for Earth Grant, Ensaras, Inc., 2018
- Army SBIR Grant, Ensaras, Inc., 2017-2018

Industrial

- IBM Research Technical Accomplishment Award for Application Assembly & Optimization 2.0, 2013
- IBM Research Technical Accomplishment Award for Incentive Plan Analytics, 2013
- IBM Research Technical Accomplishment Award for Computational Creativity, 2013
- IBM Research Technical Accomplishment Award for Crowdsourcing Analytics, 2013
- IBM Research Technical Accomplishment Award for BAO Estimation Workbench, 2013
- Publication Achievement Award, IBM Services Research, 2013
- IBM Eminence and Excellence Award for contributions to Liquid Crowdsourcing, 2012
- IBM Eminence and Excellence Award for contributions to Incentive Plan Design, 2012
- Publication Achievement Award, IBM Services Research, 2012

For Supervised/Mentored Research

- ECE Distinguished Research Fellowship, 2019, S. Basu
- Dilip and Sandhya Sarwate Graduate Fellowship, 2018, S. Basu
- Computational Science and Engineering Fellowship, 2018, S. Spencer
- CompGen Fellowship, 2017, A. Sarathy
- Joan and Lalit Bahl Fellowship, 2017, R. K. Raman
- All University Doctoral Prize, 2016, A. Vempaty
- 2013 Best Student Paper Award of the IEEE Data Storage Technical Committee, A. H. Salavati
- 1st Place in Student Paper Contest, 2012 IEEE Sensor Array and Multichannel Signal Processing Workshop, J. B. Rhim
- David Adler Memorial Thesis Prize (best MIT electrical engineering M.Eng. thesis), V. Misra
- Gold Medal at 2008 International Genetically Engineered Machines (iGEM) competition

For Student Group Advising

- Eta Kappa Nu (HKN) Outstanding Chapter Award, 2020
- Eta Kappa Nu (HKN) Outstanding Chapter Award, 2019

Research Grants and Gifts

- *IBM Faculty Award, Toward Cognitive Systems for Scientific Discovery*, 2014, [PI]
- *SRC/DARPA Systems on Nanoscale Information fabriCs (SONIC) Center*, 2014–2017, [co-PI, with N. Shanbhag (director)]
- *NSF EAGER: Matching Non-Native Transcribers to the Distinctive Features of the Language Transcribed*, 2015–2017, [co-PI, with M. Hasegawa-Johnson and P. Jyothi]
- *ILSDI Investigating the Neural Correlates of Learning in Cognitive Training*, 2015 [co-PI, with A. Barbey, et al.]
- *NSF CIF: EAGER: Towards an Information Theory of Attention*, 2016–2018, [PI]
- *NSF MBDH / CCC Towards an Interoperable Food Data Ontology*, 2016, [PI]
- *Los Alamos National Laboratory: Computational Creativity for Materials*, 2016, [PI]
- *Air Force STTR: UMIMMI: Universal Multivariate Information Measures for Multisensor Inference (Phase I)*, 2016–2017, [PI]
- *Illinois Proof-of-Concept Award: Machine Learning for Nanopore Bio-Detection*, 2016–2017, [co-PI, with J.-P. Leburton]
- *IBM Illinois Center for Cognitive Computing Systems Research (C3SR)*, 2016–2021
 - Creative Experiential Learning Advisor [PI]
 - Blockchain Systems [co-PI, with A. Miller]
- *SRC/DARPA: Energy Efficient Image Storage and Compression with RRAM Arrays*, 2017, [co-PI]
- *Siebel Energy Institute: Incentives, Choices, and Analytics for Electric Vehicle Fleets in Jointly Managing Urban Traffic and the Smart Grid*, 2017, [PI, with S. Bose and T. Basar]

- *NSF CIF: Small: Foundations of Belief Sharing in Human-Machine Systems*, 2017–2021, [PI]
- *Air Force STTR: UMIMMI: Universal Multivariate Information Measures for Multisensor Inference (Phase II)*, 2017–2019, [PI]
- *ZJUI Research Program: Universal Compression of Deep Networks at the Information-Theoretic Limit*, 2018–2019, [PI]
- *Chan Zuckerberg Initiative: Compression of Structural, Cartographic, and Multimodal Cell Data*, 2018–2019, [PI]
- *USDA National Institute of Food and Agriculture: Comparative Connectome of the Soybean Cyst Nematode and Establishment of an Online Anatomical Atlas*, 2018–2019, [co-PI, with N. Schroeder]
- *FACE Foundation (French Embassy in the United States): Thomas Jefferson Fund: Reliable Artificial Intelligence on Energy-Efficient Hardware*, 2018–2020, [PI, with E. Dupraz]
- *Center for Digital Agriculture: Virtual Farming Networks for Smallholders through Digital Communities of Trust*, 2019–2020, [PI, with A. Davis]
- *General Dynamics Corporation: Human Gesture Analysis Recognition and Computer Vision Assistance for Tactical Environments*, 2019, [PI]
- *Facebook: AI Tools for Localized Concrete Formulation*, 2019, [PI]
- *National Research Foundation, Prime Minister's Office (Singapore): Crowdsourcing, Choice Modelling, and Prediction for Healthy Eating*, 2019–2020, [PI, with E.-E. Lim]
- *Facebook: Smart Concrete for FB Data Centers*, 2019–2020, [PI]
- *NSF ECCS: Efficient Strategies for Pandemic Monitoring and Recovery*, 2020–2023, [co-PI, with V. Veeravalli]
- *ZJUI Research Program: Center for Pathogen Diagnostics*, 2020–2025, [co-PI]
- *Interstellar Initiative, AMED (Japan): Age-dependent Trajectory of Exosomal Protein Distribution in Healthy Aging and Alzheimer's Pathology*, 2020–2021, [co-PI]
- *USDA, NIFA: Neuronal Basis of Feeding Behavior in a Plant-parasitic Nematode*, 2021–2025, [co-PI, with N. Schroeder]

Selected Service Activities

Scientific Advisory Board

- AI XPRIZE, 2016–present
- NAS Science and Entertainment Exchange, 2014–2017

Journal Editorships

- Associate Editor, *Frontiers in Big Data*, 2014–2020
- Guest Editor, *Intelligence*

University and College Service

- Chair of Curriculum Committee for B.S. degree in Innovation, Leadership, and Engineering Entrepreneurship (ILEE), 2016–present
- Steering Committee, Illinois Learning Sciences Design Initiative (ILSDI), 2014–2016
- Steering Committee, Center for Digital Agriculture, 2018–present
- University-wide Entrepreneurship minor Committee, 2018–2019
- Search Committee, Innovation, Leadership, and Engineering Entrepreneurship (ILEE) clinical faculty, 2019
- College Executive Committee Representative for CSL (alternate), 2019–2020

Department Service

- Chair, Public Relations Committee, 2018–2019
- Curriculum, Graduate, Fellowship, Graduate Recruitment, and Colloquium Committees

Elected Professional Committees

- Founding Member, IEEE Special Interest Group on Big Data in Signal Processing

- Contributor, Visibility Initiative, IEEE Signal Processing Society

Professional Committees

- Member, IEEE Information Theory Society, Shannon Centenary Committee
- Member, IEEE Information Theory Society, Membership Committee

Judging

- NAE “The Next MacGyver” competition, 2015

Workshop/School Organization Committees

- KDD 2017: Workshop on Creative Assistants: Augmenting Creativity using Machine Learning
- KDD 2017: 1st International Workshop on Data-Driven Discovery
- 2016 IEEE GlobalSIP Symposium on Signal Processing of Big Data — general chair
- KDD 2014 Workshop on Data Mining for Educational Assessment and Feedback (ASSESS 2014) — co-chair
- 2012 IEEE North American School of Information Theory — technical program chair
- SRII Global Conference 2012 — track chair
- 2nd International Workshop on Cross Enterprise Collaboration (CEC 2011) — co-chair

Special Session Organization

- 2019 IEEE International Symposium on Information Theory (ISIT): “Deep Learning for Compression”
- 2019 AAAS Annual Meeting: “Blockchain and the Scientific Method”
- 2017 Allerton Conference: “Foundations of the Sharing Economy”
- 2017, 2016 Allerton Conference: “Big Data in Signal Processing”
- 2015 Information Theory and Applications Workshop (ITA): “Computational Creativity”

Technical Program Committees

- 2019 ACM Knowledge Discovery and Data Mining (KDD)
- 2019 International Conference on Computational Creativity (ICCC)
- 2019 IEEE International Conference on Communications (ICC)
- 2018 IEEE Data Science Workshop
- IEEE Global Communications Conference (Globecom 2018)
- 26th European Signal Processing Conference (EUSIPCO 2018)
- 1st Workshop on Blockchain-enabled Networked Sensor Systems (BlockSys 2018)
- 2018 ACM COMPASS
- 2018 International Conference on Computational Creativity (ICCC)
- 2018 AAAI Conference
- IMA Industrial Mathematics Workshop and Clinic, 2017
- 2018 IEEE International Conference on Communications (ICC)
- 2017 International Conference on Computational Creativity (ICCC)
- 2017 ACM Knowledge Discovery and Data Mining (KDD)
- IEEE 2017 International Conference on Distributed Computing in Sensor Systems (DCOSS)
- 2017 AAAI Conference
- 2016 IEEE International Symposium on Technology and Society (ISTAS 2016)
- 2016 Allerton Conference on Communication, Control and Computing
- 2016 IEEE Globecom
- 5th Int. Workshop on Computational Creativity, Concept Invention, and General Intelligence (C3GI 2016)
- 2016 AAAI International Conference on Computational Creativity (ICCC)
- ICDM 2015 Workshop on Data Mining for Educational Assessment and Feedback (ASSESS 2015)
- 2015 Illinois Learning Sciences Design Laboratory Symposium
- 2015 Allerton Conference on Communication, Control and Computing
- IEEE 2015 International Conference on Distributed Computing in Sensor Systems (DCOSS)
- 2015 IEEE International Symposium on Information Theory (ISIT)

- 2015 AAAI International Conference on Computational Creativity (ICCC)
- 2015 IEEE International Symposium on Technology and Society (ISTAS 2015)
- Session Organizer, 2015 Information Theory and its Applications Workshop (ITA)
- 2014 Allerton Conference on Communication, Control and Computing
- 2014 AAAI International Conference on Computational Creativity (ICCC)
- IEEE 2014 International Conference on Distributed Computing in Sensor Systems (DCOSS)
- 2nd International Workshop on Service Clouds in the Enterprise and Beyond 2013
- IEEE 2012 Services Workshop on Social Media and Services
- IEEE 2012 Services Workshop on Service Delivery and Team Performance in a Globalized Environment
- 2012 IEEE Statistical Signal Processing Workshop
- International Conference on Industrial, Engineering and Other Applications of Applied Intelligent Systems (IEA/AIE 2011)

Book, Journal, and Conference Reviewer

Web Services Handbook • Handbook on Information and Coding Theory • Nature Neuroscience • Nature Electronics • Psychological Review • Royal Society Open Science • Scientific Reports • Philosophical Transactions of the Royal Society B • IEEE Transactions on Information Theory • IEEE Transactions on Signal Processing • IEEE Transactions on Communications • IEEE Transactions on Wireless Communications • IEEE Transactions on Image Processing • IBM Journal of Research and Development • IEEE Journal on Selected Areas in Communications • IEEE Communications Letters • IEEE Transactions on Information Forensics and Security • IEEE Transactions on Pattern Analysis and Machine Intelligence • IEEE Transactions on Network Science and Engineering • IEEE Computer • IEEE Pervasive Computing • IEEE Technology and Society Magazine • IEEE Sensors Journal • IEEE Networking Letters • IEEE Photonics Technology Letters • ACM Transactions on Intelligent Systems and Technology • Automatica • Trends in Neuroscience & Education • Statistics & Probability Letters • PLoS ONE • Signal, Image and Video Processing • Digital Signal Processing • Mathematics in Computer Science • Future Internet • Axioms • IEEE Potentials • IEEE International Symposium on Information Theory • Neural Information Processing Systems Conference • International Conference on Machine Learning • Conference on Cognitive Computational Neuroscience • ACM Conference on Human Factors in Computing Systems • IEEE Data Compression Conference • IEEE Global Communications Conference • IEEE Information Theory Workshop • IEEE Region 8 Conference (EuroCon) • IEEE International Conference on Smart Grid Communications • International Symposium on Turbo Codes & Iterative Information Processing • Annual Meeting of the Association for Computational Linguistics • Collaborative Organizations and Social Media Symposium

Magazine Boards of Advisors

UPTUWatch, 2010–2012

Past Academic Positions

Massachusetts Institute of Technology

Research Affiliate

Nov. 2010–Dec. 2013

Research Laboratory of Electronics

Postdoctoral Associate

Apr. 2010–July 2010

Research Laboratory of Electronics

Research Assistant and NSF Graduate Research Fellow

Aug. 2004–Mar. 2010

Laboratory for Information and Decision Systems

Research Laboratory of Electronics

École Polytechnique Fédérale de Lausanne

June 2006–Aug. 2006

Visiting Researcher

Laboratoire de Théorie de l'Information

Laboratoire de Théorie des Communications

Cold Spring Harbor Laboratory

Visiting Scientist

Theoretical Neuroscience

Jan. 2005, continuing

Cornell University

Undergraduate Researcher

Communication Networks Research Group

Research Assistant

Bovay Program in History and Ethics of Engineering, Cornell University

Sept. 2003–June 2004

Jan. 2003–May 2003

SUNY Upstate Medical University

Research Volunteer

Nuclear Medicine Division

June 1998–Dec. 1998

Past Industrial Positions

Syracuse Research Corporation

Research Engineering Intern

May 2003–Aug. 2003

Aug. 2002–Jan. 2003

Sensis Corporation

Engineering Intern

May 2001–Aug. 2001

Invited Talks

Plenary and Keynote

- National Science Olympiad Competition: 31 May 2019.
- 22nd Conference of the International Association for World Englishes (IAWE 2017): 1 Jul. 2017.
- KAUST-NSF Conference on Electronic Materials, Devices, and Systems for a Sustainable Future, Thuwal, Saudia Arabia: 14-16 Mar. 2016.
- Wired A.I. 2015 Tokyo: 30 Sep. 2015
- When Boole Meets Shannon Workshop, Cork, Ireland: 1-2 Sep. 2015
- Sirha World Cuisine Summit, Lyon, France: 27 Jan. 2015
- Falling Walls, International Conference on Future Breakthroughs in Science and Society, Berlin, Germany: 9 Nov. 2013

Tutorials

- IEEE International Symposium on Information Theory (ISIT), Vail, CO: 17 June 2018
- Information Theory and Applications Workshop (ITA), San Diego, CA: 15 Feb. 2018

Panels

- Bühler GO!2020, Minneapolis, MN: 15-19 June 2020
- AI for Good Global Summit (United Nations), Geneva, Switzerland: 28-31 May 2019
- Partners in Business Ethics Symposium: Ethics in a Data-Driven World, Urbana, IL: 23-24 Oct. 2018
- Good Food Conference, Berkeley, CA: 6-7 Sept. 2018
- IFT18 (Institute of Food Technologists), Chicago, IL: 17 July 2018
- World Science Festival, New York, NY: 31 May 2017
- SXSW Interactive 2014, Austin, TX: 7 Mar. 2014

Invited Conference Talks

- International Conference of Social Computing, Beijing, China: 14 Dec. 2020
- Next-Gen AI for Proliferation Detection: Explainable AI Systems By Design: 15-16 Sept. 2020

- International Workshop on Signal and Information Intelligent Learning and Processing, Xi'an, China:16 Aug. 2020
- Science of Science, Beijing, China: 10-11 June 2019
- Data Science and Optimal Learning for Materials Discovery and Design, Santa Fe, NM: 16 May 2016
- Computational Gastronomy: Food in the Age of Data Workshop, Kavli Royal Society International Centre, Chicheley Hall, England: 29 Sep. 2014
- CNS*2014 Workshop on Methods of Information Theory in Computational Neuroscience, Quebec City, Canada: 30 July 2014
- NEXT, Event for Technology, Manufacturing & Innovation, Syracuse, NY: 19 Nov. 2013

Research Demonstrations

- IBM Research Cognitive Systems Colloquium, IBM Thomas J. Watson Research Center, Yorktown Heights, NY: 2 Oct. 2013
- Sigma Pi Phi 20th Biennial Northeast Region Meeting, Greenwich, CT: 28 Sep. 2013
- IBM Board of Directors Meeting, New York, NY: 23 Sep. 2013
- Best of IBM Meeting, Grand Cayman, Cayman Islands: 7 Jun. 2013
- IBM Investors Briefing, IBM Almaden Research Center, San Jose, CA: 27 Feb. 2013

Research Talks

- Indian Institute of Technology, Bombay, Mumbai, India: 6 July 2020.
- Chan Zuckerberg Initiative, Redwood City, CA: 27 Mar. 2020.
- Google Magenta, Mountain View, CA: 3 Mar. 2020.
- Information Systems Laboratory, Stanford University, Palo Alto, CA: 6 Sept. 2019.
- Tsinghua Joint Research Center for Knowledge and Intelligence, Tsinghua University, Beijing, China: 12 June 2019.
- SILO Seminar, University of Wisconsin, Madison: 10 Apr. 2019
- ECE Seminar, Purdue University, IN: 28 Feb. 2019
- BLISS Seminar, University of California Berkeley: 5 Sept. 2018
- IBM Thomas J. Watson Research Center, Yorktown Heights, NY: 12 Aug. 2018
- Center for Statistics and Machine Learning Seminar, Princeton University, NJ: 29 Jan. 2018
- MIDAS Seminar, University of Michigan, Ann Arbor: 9 Jan. 2018
- Brookhaven National Laboratory, Upton, NY: 2 June 2017
- NSF Center for the Science of Information, Purdue University, IN: 3 May 2017
- CISE Seminar, Boston University, MA: 14 Apr. 2017
- Air Force Research Laboratory, Dayton, OH: 8 Feb. 2017
- MIDAS Seminar, University of Michigan, Ann Arbor: 6 Jan. 2017
- Syracuse Research Corporation, North Syracuse, NY: 4 Aug. 2016
- IBM Thomas J. Watson Research Center, Yorktown Heights, NY: 3 June 2016
- Undergraduate Neuroscience Research Symposium, University of Illinois at Urbana-Champaign: 29 Apr. 2016
- Yahoo!-DAIS Seminar, University of Illinois at Urbana-Champaign: 19 Apr. 2016
- Cisco Systems, Inc.: 26 Feb. 2016
- Electrical and Computer Engineering Graduate Seminar, Michigan State University, East Lansing: 5 Nov. 2015
- Center for Nonlinear Studies, Los Alamos National Laboratory, NM: 21 Oct. 2015
- Redwood Center for Theoretical Neuroscience, University of California, Berkeley: 22 Jul. 2015
- Computational Science and Engineering Seminar, University of Illinois at Urbana-Champaign: 18 Feb. 2015

- Knowledge Lab, Computation Institute, University of Chicago: 13 Oct. 2014
- Systems On Nanoscale Information fabriCs (SONIC) Center, Champaign, IL: 27 May 2014
- Department of Electrical Communication Engineering, Indian Institute of Science, Bangalore: 16 May 2014
- Department of Electrical Engineering and Computer Science, University of Central Florida, Orlando: 24 Mar. 2014
- Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign: 20 Feb. 2014
- Communications Seminar, Coordinated Science Laboratory, University of Illinois at Urbana-Champaign: 3 Feb. 2014
- Research Laboratory of Electronics, Massachusetts Institute of Technology, Cambridge: 24 Oct. 2013.
- Department of Electrical and Computer Engineering, Northeastern University, Boston, MA: 24 Oct. 2013.
- Department of Electrical and Computer Engineering, Polytechnic Institute of New York University: 18 Oct. 2013.
- PDT Partners, New York, NY: 16 Sep. 2013.
- Barabasi Lab, Northeastern University, Boston, MA: 21 Jun. 2013.
- Santa Fe Institute, NM: 14 Jun. 2013.
- Center for Nonlinear Studies, Los Alamos National Laboratory, NM: 12 Jun. 2013.
- Operations Management Seminar, Leonard N. Stern School of Business, New York University: 13 May 2013.
- Electrical Engineering and Computer Science Department, Northwestern University, Evanston, IL: 8 Apr. 2013.
- Ming Hsieh Department of Electrical Engineering, University of Southern California, Los Angeles, CA: 4 Apr. 2013.
- Department of Electrical Engineering and Computer Sciences, University of California, Berkeley: 14 Mar. 2013.
- Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign: 4 Mar. 2013.
- Department of Electrical and Computer Engineering, University of California, San Diego, La Jolla, CA: 19 Feb. 2013.
- Cognitive and Algorithmic Decision Making Center, University of Illinois at Urbana-Champaign: 5 Oct. 2012.
- International Centre for Theoretical Sciences, Tata Institute of Fundamental Research, Bangalore, India: 11 July 2012.
- Centre for Applicable Mathematics, Tata Institute of Fundamental Research, Bangalore, India: 10 July 2012.
- International Centre for Theoretical Sciences, Tata Institute of Fundamental Research, Bangalore, India: 15 and 16 Feb. 2012.
- NSF Science of Information Center, University of California, San Diego, La Jolla, CA: 8 Feb. 2012.
- Applied Probability Seminar, IBM Thomas J. Watson Research Center, Yorktown Heights, NY: 11 Jan. 2012.
- Probabilistic Networks Group, Yale University, New Haven, CT: 11 May 2011.
- Communications Seminar, Coordinated Science Laboratory, University of Illinois at Urbana-Champaign: 28 March 2011.
- Department of Electrical Engineering and Computer Science, Syracuse University, NY: 18 Feb. 2011.
- Department of Electrical and Computer Engineering, Carnegie Mellon University, Pittsburgh, PA: 26 Apr. 2010.
- IBM Thomas J. Watson Research Center, Hawthorne, NY: 2 Apr. 2010.
- Department of Electrical and Computer Engineering, University of Minnesota, Minneapolis: 18 Feb. 2010.

- Schlumberger-Doll Research Center, Cambridge, MA: 16 July 2010.
- Alcatel-Lucent Bell Laboratories, Murray Hill, NJ: 3 Mar. 2010.
- Center for Nonlinear Studies, Los Alamos National Laboratory, NM: 19 Jan. 2010.
- Lincoln Laboratory, Massachusetts Institute of Technology, Lexington: 10/15 Dec. 2009.
- School of Electrical and Computer Engineering, Cornell University, Ithaca, NY: 8 Dec. 2009.
- Applied Physics Laboratory, Johns Hopkins University, Laurel, MD: 30 Oct. 2009.
- Naval Research Laboratory, Washington, DC: 23 Oct. 2009.
- Reich Laboratory, Department of Genetics, Harvard Medical School, Boston, MA: 7 Oct. 2009.
- Lawrence Livermore National Laboratory, CA: 25 June 2009.
- Janelia Farm Research Campus, Howard Hughes Medical Institute, Ashburn, VA: 22 Aug. 2008.
- Instituto de Sistemas e Robótica, Instituto Superior Técnico, Lisbon, Portugal: 14 May 2008.
- Departamento de Ciência de Computadores, Universidade do Porto, Portugal: 12 May 2008.
- Networking, Communications, and DSP Seminar, Department of Electrical Engineering and Computer Sciences, University of California, Berkeley: 29 Aug. 2007.
- Biomedical Imaging and Analysis Seminar, Computer Science and Artificial Intelligence Laboratory, Massachusetts Institute of Technology, Cambridge: 19 Oct. 2006.
- Lincoln Laboratory, Massachusetts Institute of Technology, Lexington: 8 Jan. 2004.

Publications

Preprints and Working Papers

- [*] G. S. Ramachandran, I. Brugere, L. R. Varshney, and C. Xiong, “GAEA: Graph Augmentation for Equitable Access via Reinforcement Learning,” arXiv:2012.03900 [cs.LG].
- [*] S. Spencer and L. R. Varshney, “Social Bubbles and Superspreaders: Source Identification for Contagion Processes on Hypertrees,” arXiv:2010.11350 [eess.SP].
- [*] H. Zhou, J. Chen, L. R. Varshney, and A. Jagmohan, “Nonstationary Reinforcement Learning with Linear Function Approximation,” arXiv:2010.04244 [cs.LG].
- [*] P. Rana and L. R. Varshney, “Planting Trees at the Right Places: Recommending Suitable Sites for Growing Trees using Algorithm Fusion,” arXiv:2009.08002 [cs.CY].
- [*] S. Basu, G. S. Ramachandran, N. S. Keskar, and L. R. Varshney, “Mirostat: A Perplexity-Controlled Neural Text Decoding Algorithm,” arXiv:2007.14966 [cs.CL].
- [*] J. Vig, A. Madani, L. R. Varshney, C. Xiong, R. Socher, and N. F. Rajani, “BERTology Meets Biology: Interpreting Attention in Protein Language Models,” bioRxiv 174417.
- [*] A. Mani, L. R. Varshney, and A. Pentland, “Quantization Games on Social Networks and Language Evolution,” arXiv:2006.00584 [cs.IT].
- [*] V. S. S. Nadendla and L. R. Varshney, “A Difficulty in Controlling Blockchain Mining Costs via Cryptopuzzle Difficulty,” arXiv:2005.05521 [cs.GT].
- [*] L. R. Varshney and R. Socher, “COVID-19 Growth Rate Decreases with Social Capital,” medRxiv 2020.04.23.20077321
- [*] L. Marla, L. R. Varshney, D. Shah, N. A. Prakash, and M. E. Gale, “Short and Wide Network Paths,” arXiv:1911.00344 [cs.NE].
- [*] H. Yu, I. Mineyev, and L. R. Varshney, “Orbit Computation for Atomically Generated Subgroups of Isometries of Z_n ,” arXiv:1910.01317 [math.GR].
- [*] N. S. Keskar, B. McCann, L. R. Varshney, C. Xiong, and R. Socher, “CTRL: A Conditional Transformer Language Model for Controllable Generation,” arXiv:1909.05858 [cs.CL].

- [*] L. Wang, H. Zhou, B. Li, L. R. Varshney, and Z. Zhao, “Nearly Optimal Algorithms for Piecewise-Stationary Cascading Bandits,” arXiv:1909.05886 [cs.LG].
- [*] L. R. Varshney, N. S. Keskar, and R. Socher, “Pretrained AI Models: Performativity, Mobility, and Change,” arXiv:1909.03290 [cs.CY].
- [*] T. Nishida, L. R. Varshney, and Y. Ishikawa, “Dynamic Network Signatures of Labor Flows: Evidence from a Large Business Social Network,” submitted.
- [*] D. G. Dobakhshari, L. R. Varshney, and V. Gupta, “Mechanism Design for Task Delegation to Agents with Private Ordering Preferences,” arXiv:1902.00138 [math.OC].
- [*] D. Seo and L. R. Varshney, “The CEO Problem with r th Power of Difference and Logarithmic Distortions,” arXiv:1812.00903 [cs.IT].
- [*] H. Yu, I. Mineyev, and L. R. Varshney, “A Group-Theoretic Approach to Abstraction: Hierarchical, Interpretable, and Task-Free Clustering,” arXiv:1807.11167 [cs.LG].
- [*] S. Basu and L. R. Varshney, “Universal and Succinct Source Coding of Deep Neural Networks,” arXiv:1804.02800 [cs.IT].
- [*] T.-Y. Wu, A. Tandon, L. R. Varshney, and M. Motani, “Skip-Sliding Window Codes,” arXiv:1711.09494 [cs.IT].
- [*] R. K. Raman and L. R. Varshney, “Dynamic Distributed Storage for Scaling Blockchains,” arXiv:1711.07617 [cs.IT].

Journal and Magazine Articles

- [J66] P. Rana and L. R. Varshney, “Trustworthy Predictive Algorithms for Complex Forest System Decision Making,” *Frontiers in Forests and Global Change*, to appear.
- [J65] A. Tandon, V. Y. F. Tan, and L. R. Varshney, “The Bee-Identification Error Exponent with Absentee Bees,” *IEEE Transactions on Information Theory*, vol. 66, no. 12, pp. 7602–7614, Dec. 2020.
- [J64] D. Seo, A. Chatterjee, and L. R. Varshney, “On Multiple-Access in Queue-Length Sensitive Systems,” *IEEE Open Journal of the Communications Society*, vol. 1, pp. 1244–1255, 2020.
- [J63] L. R. Varshney, “Impact of AI on Employment,” *Digital Skills Insights*, International Telecommunications Union, pp 40–47, 2020.
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- [P46] H. Yu, L. R. Varshney, and G. Stein-O'Brien, "Towards Learning Human-Interpretable Laws of Neurogenesis from Single-Cell RNA-Seq Data via Information Lattices," presented at *Learning Meaningful Representations of Life Workshop at NeurIPS 2019*, Vancouver, Dec. 2019.
- [P45] S. Basu and L. R. Varshney, "Universal and Succinct Source Coding of Deep Neural Networks," presented at *Stanford Compression Workshop 2019*, Palo Alto, Feb. 2019.
- [P44] T.-Y. Wu, A. Tandon, L. R. Varshney, and M. Motani, "Multicasting Energy and Information Simultaneously," presented at *2018 IEEE Information Theory Workshop*, Guangzhou, Nov. 2018.
- [P43] H. Ito, T. Nishida, L. R. Varshney, and Y. Ishikawa, "Weak Ties in Job Change: Evidence from Business Card Exchange in Japan," presented at *2018 International Conference on Computational Social Science*, Evanston, July 2018.
- [P42] M. Kazama, M. Sugimoto, C. Hosokawa, K. Matsushima, L. R. Varshney, and Y. Ishikawa, "A Novel System for Transformation of Regional Cuisine Style," presented at *2018 International Conference on Computational Social Science*, Evanston, July 2018.
- [P41] H. Ito, T. Nishida, L. R. Varshney, and Y. Ishikawa, "Weak Ties in Job Change: Evidence from Business Card Exchange in Japan," presented at *NetSci: International School and Conference on Network Science*, Paris, June 2018.
- [P40] L. R. Varshney, L. Marla, and D. Shah, "Computing Information-Theoretic Limits on Behavioral Speed in *C. elegans* and *Ciona intestinalis* (L.)," presented at *Analysis and Interpretation of Connectomes*, Janelia Research Campus, Ashburn, May 2018.
- [P39] N. Kshetry and L. R. Varshney, "Optimal Wastewater Management Using Advanced Analytics," presented at *2018 Illinois Wastewater Professionals Conference*, Springfield, Apr. 2018.
- [P38] L. R. Varshney and K. R. Varshney, "Decision Making with Quantized Priors Leads to Discrimination," presented at *Illinois Summit on Diversity in Psychological Science*, Champaign, Mar. 2018.
- [P37] T.-Y. Wu, A. Tandon, L. R. Varshney, and M. Motani, "On Skip Sliding Window Codes," presented at *2018 Information Theory and its Applications Workshop (ITA)*, San Diego, Feb. 2018.

- [P36] A. Chatterjee and L. R. Varshney, "Optimal Energy Allocation in Reliable Neural Sensory Processing," presented at *Inaugural Conference on Cognitive Computational Neuroscience (CCN)*, New York, Sept. 2017.
- [P35] A. Vempaty, L. R. Varshney, and P. K. Varshney, "A Coupon-Collector Model of Machine-Aided Discovery," presented at *KDD Workshop on Data-Driven Discovery*, Halifax, Aug. 2017.
- [P34] X. Ge, J. Xiong, and L. R. Varshney, "CELA: Creating Experiential Learning Activities," presented at *International Conference on Computational Creativity*, Atlanta, June 2017.
- [P33] A. D. Patil, N. R. Shanbhag, L. R. Varshney, E. Pop, H.-S. P. Wong, S. Mitra, J. Rabaey, J. Weldon, L. Pileggi, S. Manipatruni, D. Nikonov, and I. A. Young, "A Systems Approach to Computing in Beyond CMOS Fabrics," presented at *Design Automation Conference (DAC 2017)*, Austin, June 2017.
- [P32] A. Sarathy, J.-P. Leburton, and L. R. Varshney, "On Nanopore Sequencing of the Epigenome in the Presence of Noise," presented at *15th Canadian Workshop on Information Theory*, Quebec City, June 2017.
- [P31] M. Jere, R. K. Raman, and L. R. Varshney, "The EurekaMetric Connectome: Discovering Unexplored Areas of Neuroscience Research," presented at *NetSci: International School and Conference on Network Science*, Indianapolis, June 2017.
- [P30] D. Bhattacharjya and L. R. Varshney, "Multiattribute Preference Models for Computational Creativity," presented at *INFORMS Annual Meeting*, Nashville, Nov. 2016.
- [P29] A. Chatterjee and L. R. Varshney, "The Role of Information Theory and Queuing Theory in Human Computation Systems," presented at *HCOMP 2016 Workshop on Mathematical Foundations of Human Computation*, Austin, Nov. 2016.
- [P28] N. Kshetry and L. R. Varshney, "Foodsheds in Virtual Water Flow Networks: A Spectral Graph Theory Approach," presented at *Food and Data Workshop: Interoperability through the Food Pipeline*, Urbana, Sept. 2016.
- [P27] L. Chang and L. R. Varshney, "World Culture of Food Texture Networks," presented at *Food and Data Workshop: Interoperability through the Food Pipeline*, Urbana, Sept. 2016.
- [P26] A. J. Gross, D. Murthy, and L. R. Varshney, "Pace of Life in Cities and the Emergence of Town Tweeters," presented at *66th Annual Conference of the International Communication Association (ICA)*, Fukuoka, June 2016.
- [P25] Z. He and L. R. Varshney, "Inducement Prizes in Data Science: Specialization, Community, and National Performance," presented at *International Symposium on Science of Science*, Washington, Mar. 2016.
- [P24] A. Tandon, M. Motani, and L. R. Varshney, "Coding for Constrained Communication Systems," presented at *Information Theory and its Applications Workshop (ITA)*, San Diego, Feb. 2016.
- [P23] I. Lobel, E. Sadler, and L. R. Varshney, "Customer Referral Incentives and Social Media," presented at *16th ACM Conference on Economics and Computation (EC 2015)*, Portland, Jun. 2015.
- [P22] A. J. Gross, D. Murthy, and L. R. Varshney, "Pace of Life in Cities and the Emergence of Town Tweeters," presented at *International Conference on Computational Social Science (IC2S2)*, Helsinki, Jun. 2015.
- [P21] L. R. Varshney, "Are there Informational Limits to Creativity?," presented at *Information Theory and its Applications Workshop (ITA)*, San Diego, Feb. 2015.
- [P20] L. R. Varshney, "Block Diagrams in Information Theory: Drawing Things Closed," presented at *SHOT Special Interest Group on Computers, Information, and Society Workshop 2014*, Dearborn, Nov. 2014.

- [P19] E. Sadler, I. Lobel, and L. R. Varshney, "Customer Referral Incentives and Social Media," presented at *INFORMS Annual Meeting*, San Francisco, Nov. 2014.
- [P18] N. Shao, K. R. Varshney, L. R. Varshney, and F. Pinel, "Personalization of Product Novelty Assessment via Bayesian Surprise," presented at *2014 Joint Statistical Meetings (JSM)*, Boston, Aug. 2014.
- [P17] A. Vempaty, L. R. Varshney, and P. K. Varshney, "Error-Correcting Codes allow Privacy and Quality Assurance in Crowdsourcing," presented at *CrowdConf 2013*, San Francisco, Oct. 2013.
- [P16] F. Pinel, L. R. Varshney, and L. Tounsi, "Information in Networks as Inspiration: Value for Culinary Computational Creativity," presented at *Workshop on Information in Networks (WIN)*, New York, Oct. 2013.
- [P15] L. R. Varshney, "Fundamental Limits of Data Analytics for Sequential Selection," presented at *Information Theory and its Applications Workshop (ITA)*, San Diego, Feb. 2013.
- [P14] A. Mani, L. R. Varshney, and A. Pentland, "Focal Vocabularies vs. Shared Vocabularies in Social Networks: Balancing Individual Concerns and Social Exchange," presented at *Interdisciplinary Workshop on Information and Decision in Social Networks (WIDS)*, Cambridge, Nov. 2012.
- [P13] L. R. Varshney, "Directed Acyclic Motifs for Conversation Analytics," presented at *Interdisciplinary Workshop on Information and Decision in Social Networks (WIDS)*, Cambridge, Nov. 2012.
- [P12] D. Bhattacharjya, L. R. Varshney, F. Pinel, and Y.-M. Chee, "Computational Creativity: A Two-attribute Search Technique," presented at *INFORMS Annual Meeting*, Phoenix, Oct. 2012.
- [P11] A. Wein, J. Kusuma, L. R. Varshney, A. Richardson, and L. Srinivasan, "A Path towards Robust Sub-Nyquist Spike Acquisition for Neuroscience Applications," presented at *34th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, San Diego, Aug. 2012.
- [P10] R. Williams, W. M. Gifford, and L. R. Varshney, "Using Statistical Algorithms to Predict Abuse against Children and Prioritize Cases," presented at *18th National Conference on Child Abuse and Neglect*, Washington, Apr. 2012.
- [P9] A. K. Fletcher, S. Rangan, L. R. Varshney, and A. Bhargava, "Neural Connectivity and Receptive Field Estimation via Hybrid Message Passing," presented at *Information Theory and its Applications Workshop (ITA)*, San Diego, Feb. 2012.
- [P8] L. Srinivasan, L. R. Varshney, and J. Kusuma, "Spike Acquisition at Ultra-Low Sampling Rates for Neuroprosthetic Devices," presented at *Neuroscience 2010, SfN 40th Annual Meeting*, San Diego, Nov. 2010.
- [P7] L. R. Varshney, "Communication with Unreliable Receivers," presented at *Information Theory and its Applications Workshop (ITA)*, San Diego, Feb. 2010.
- [P6] V. Misra, V. K. Goyal, and L. R. Varshney, "Distributed Functional Scalar Quantization with Limited Encoder Interaction," presented at *Information Theory and its Applications Workshop (ITA)*, San Diego, Feb. 2009.
- [P5] L. R. Varshney, "Meeting Shannon: Information-Theoretic Thinking in Engineering and Science," presented at *IEEE Information Theory Workshop (ITW)*, Porto, May 2008.
- [P4] L. R. Varshney, P. J. Sjöström, and D. B. Chklovskii, "Optimal Information Storage in Noisy Synapses," presented at *Cold Spring Harbor Laboratory Meeting on Channels, Receptors & Synapses*, Cold Spring Harbor, Apr. 2006.
- [P3] D. B. Chklovskii and L. R. Varshney, "Noisy Synapses and Information Storage," presented at *Neuroscience 2005, SfN 35th Annual Meeting*, Washington, Nov. 2005.

- [P2] L. R. Varshney and D. B. Chklovskii, "Reliability and Information Storage Capacity of Synapses," presented at *Cold Spring Harbor Laboratory Meeting on Learning & Memory*, Cold Spring Harbor, Apr. 2005.
- [P1] L. R. Varshney and S. D. Servetto, "A Distributed Transmitter for the Sensor Reachback Problem based on Radar Signals," presented at *NSF-RPI Workshop on Pervasive Computing and Networking*, Troy, Apr. 2004.

Newsletter Articles

- [N4] H. Yu and L. R. Varshney, "On 'Composing Music by a Stochastic Process': From Computers that are Human to Composers that are Not Human," *IEEE Information Theory Society Newsletter*, vol. 67, no. 4, pp. 18–19, Dec. 2017.
- [N3] L. R. Varshney, "Surprise in Computational Creativity and Machine Science," *INFORMS Decision Analysis Today*, vol. 32, no. 1, pp. 25–28, Apr. 2013.
- [N2] L. R. Varshney, "Recruitment Analytics," *Aspiring Minds Talent Prism*, vol. 21, Dec. 2012.
- [N1] L. R. Varshney, "Information Asymmetry: The Failure of Engineering Education Markets," *Uttar Pradesh Techno-managerial Education Watch*, July 2010.

Festschrift Contributions

- [F1] L. R. Varshney, "Mathematization and Novel Systems," in *Glimpses of Systems Theory and Novel Applications*, H. S. Sekhon, et al., Eds. Aligarh, India: Systems Society of India Punjab Chapter, 2005: pp. 144–148.

Patent Applications

- [IP23] J.-P. Leburton, L. R. Varshney, A. Sarathy, and N. B. Athreya, "Classification of Epigenetic Biomarkers and/or DNA Conformational Superstructures via Use of Atomically Thin Nanopores," 2019.
- [IP22] L. R. Varshney and R. K. Raman, "Dynamic Distributed Storage for Scaling Blockchains," 2018.
- [IP21] F. Pinel, K. Ratakonda, L. R. Varshney, and D. Wang, "Group Generation using Sets of Metrics and Predicted Success Values," 14/612698, filed 3 Feb. 2015.
- [IP20] F. Pinel, K. Ratakonda, and L. R. Varshney, "Generating Novel Work Products using Computational Creativity," 14/592960, filed 9 Jan. 2015.
- [IP19] F. Pinel, N. Shao, K. R. Varshney, and L. R. Varshney, "Computing Personalized Probabilistic Familiarity based on Known Artifact Data," 14/587021, filed 31 Dec. 2014.
- [IP18] K. C. Ratakonda and L. R. Varshney, "Optimized Menu Planning," 14/565136, filed 9 Dec. 2014. (claims priority to Provisional App. 61/913703, filed 9 Dec. 2013)
- [IP17] D. Bhattacharjya, F. Pinel, and L. R. Varshney, "Analytics-Based Design and Planning of Creative Menus," 14/564224, filed 9 Dec. 2014. (claims priority to Provisional App. 61/913703, filed 9 Dec. 2013)
- [IP16] K. R. Varshney, L. R. Varshney, and J. Wang, "Association-Based Product Design," 14/561869, filed 5 Dec. 2014. (claims priority to Provisional App. 61/913703, filed 9 Dec. 2013)
- [IP15] D. Bhattacharjya, K. R. Varshney, and L. R. Varshney, "Generating Work Products using Work Product Metrics and Predicted Constituent Availability," 14/459848, filed 14 Aug. 2014. (claims priority to Provisional App. 61/913703, filed 9 Dec. 2013)
- [IP14] F. Pinel, N. Shao, and L. R. Varshney, "Using Physicochemical Correlates of Perceptual Flavor Similarity to Enhance, Balance, and Substitute Flavors," 14/458315, filed 13 Aug. 2014.
- [IP13] F. Pinel and L. R. Varshney, "Substitution of Work Products," 14/369353, filed 5 May 2014. (claims priority to Provisional App. 61/892000, filed 18 Oct. 2013)

- [IP12] K. R. Varshney and L. R. Varshney, "An Apparatus for Active Odor Cancellation," 14/186645, filed 21 Feb. 2014. (claims priority to Provisional App. 61/913703, filed 9 Dec. 2013)
- [IP11] F. Boegelund and L. R. Varshney, "Smoothing Information Density in Spoken Words," 14/025323, filed 12 Sep. 2013.
- [IP10] K. R. Varshney and L. R. Varshney, "A System for Food Steganography," 14/011421, filed 28 Aug. 2013.
- [IP9] F. Pinel and L. R. Varshney, "Method for Dynamic Ingredient Substitution in Recipes," 13/972232, filed 21 Aug. 2013.
- [IP8] Y.-M. Chee, A. Schoergendorfer, and L. R. Varshney, "System for Olfactory Pleasantness Communication and Synthesis," 13/871689, filed 26 Apr. 2013.
- [IP7] S. Agarwal, Y.-M. Chee, J. Lee, R. R. Sindhgatta, and L. R. Varshney, "Risk-Limited Dispatch of Knowledge Work," 14/029012, filed 17 Sep. 2013.
- [IP6] S. Agarwal, B. Chance, Y.-M. Chee, J. S. Gardner, E. A. Hurst, J. Lee, R. Liu, V. K. Reddy, B. Sengupta, R. R. Sindhgatta, and L. R. Varshney, "Continuous Improvement of Global Service Delivery Augmented with Social Network Analysis," 13/851514, filed 27 Mar. 2013.
- [IP5] S. Agarwal, Y.-M. Chee, J. Lee, R. Liu, V. K. Reddy, R. R. Sindhgatta, L. R. Varshney, and J. Yang, "Accommodating Schedule Variances in Work Allocation for Shared Service Delivery," 13/835404, filed 15 Mar. 2013.
- [IP4] F. Pinel and L. R. Varshney, "Automated Creative Generation of Work Products and Work Plans," 13/847099, filed 19 Mar. 2013. (claims priority to Provisional App. 61/746317, filed 27 Dec. 2012)
- [IP3] F. Pinel, K. C. Ratakonda, and L. R. Varshney, "System and Method to Estimate Effort and Duration for Process Granularization," 13/834937, filed 15 Mar. 2013.
- [IP2] W. M. Gifford, A. Sheopuri, and L. R. Varshney, "Method and System to Design a Compensation Plan to Simultaneously Incent Performance on Objective and Subjective Metrics," 13/680002, filed 16 Nov. 2012. (claims priority to Provisional App. 61/703510, filed 20 Sep. 2012)
- [IP1] S. Mehta, R. Pimplikar, A. Singh, L. R. Varshney, and K. Visweswariah, "Multifaceted Candidate Screening," 13/670592, filed 7 Nov. 2012.

Teaching

University of Illinois at Urbana-Champaign

- ECE 313 Probability with Engineering Applications: Fall 2017, Spring 2021
- ECE 563 Information Theory: Fall 2018, Fall 2020
- ECE 398BD Making Sense of Big Data (co-teaching): Fall 2014, Spring 2015, Fall 2017, Fall 2018
- ECE 498LV Network Science – Dynamics and Flow: Spring 2017 and Spring 2018
- TE 100 Introduction to Innovation, Leadership and Engineering Entrepreneurship: Fall 2017
- ECE 562 Advanced Digital Communications: Fall 2014
- ENG 298 Heroic Systems: Pushing the Boundaries of Greatness (co-teaching): Fall 2014
- ECE 361 Digital Communications: Spring 2014, Spring 2015, and Spring 2016

Massachusetts Institute of Technology

- 6.003 Signals and Systems (Instructor): Spring 2009
- 6.972 Algorithms for Estimation and Inference (Teaching Assistant): Fall 2006

Cornell University

- ENGRG 100 Introduction to Computer Programming (Facilitator): Spring 2004, Fall 2003, and Spring 2002
- ENGRG 192 Calculus for Engineers II (Facilitator): Fall 2003 and Fall 2001

Postdoctoral Scholars

- Haizi Yu, 2019–2020, now with Knowledge Laboratory, University of Chicago
- Yongjune Kim (co-advised), 2018, now assistant professor at DGIST, Korea
- Ting-Yi Wu, 2016–2018, now assistant professor at Sun Yat-Sen University
- Avhishek Chatterjee, 2015–2017, now assistant professor at Indian Institute of Technology (IIT) Madras

Graduate Theses

- Sourya Basu, 2018–present
- Huozhi Zhou, 2019–present
- Sam Spencer, “Rumor Source Identification, Contagion Processes, and Dynamics of Social Network Formation and Evolution,” Ph.D. dissertation, University of Illinois at Urbana-Champaign, Dec. 2020.
- Daewon Seo, “Information-Theoretic Analysis of Human-Machine Mixed Systems,” Ph.D. dissertation, University of Illinois at Urbana-Champaign, Aug. 2019.
- Huozhi Zhou, “Algorithms on Graph-Structured Data with Imperfect Information,” M.S. thesis, University of Illinois at Urbana-Champaign, Aug. 2019.
- Haizi Yu, “Automatic Concept Learning via Information Lattices,” Ph.D. dissertation, University of Illinois at Urbana-Champaign, May 2019.
- Ravi Kiran Raman, “On the Information Theory of Clustering, Registration, and Blockchains,” Ph.D. dissertation, University of Illinois at Urbana-Champaign, May 2019.
- Rebecca Chen, “Missing Values Imputation and Image Registration for Genetics Applications,” M.S. thesis, University of Illinois at Urbana-Champaign, May 2019.
- Sakshi Agarwal, “A Study on Creativity: Detection and Network Structures,” M.S. thesis, University of Illinois at Urbana-Champaign, May 2019.
- Ruby Zhuang, “Science of Science: Biological Research Network,” M.S. thesis, University of Illinois at Urbana-Champaign, May 2019.
- Xiou Ge, “Computational Creativity Applications in Engineering,” M.S. thesis, University of Illinois at Urbana-Champaign, Dec. 2018.
- Linjia Chang, “Changing Edges in Graphical Model Algorithms,” M.S. thesis, University of Illinois at Urbana-Champaign, Dec. 2016.
- Aditya Vempaty [co-advisor], “Reliable Inference from Unreliable Agents, Syracuse University”, Ph.D. dissertation, Syracuse University, Jan. 2015.

Other Mentored Graduate Students

- Ankur Mani, IBM internship, 2012, now assistant professor at University of Minnesota
- Gireeja V. Ranade, IBM internship, 2011, now assistant professor at University of California, Berkeley
- Joong Bum Rhim [research mentor], Mass. Inst. Tech. S.M. thesis, 2010, now with GroupM
- Ha Q. Nguyen [research mentor], Mass. Inst. Tech. S.M. thesis, 2009, now with EPFL
- Vinith Misra [research mentor], Mass. Inst. Tech. M.Eng. thesis, 2008, now with Netflix

Undergraduate Students Supervised

- Cheshta Bhatia, Indian Institute of Science Education and Research Mohali, 2018–present
- Jiarui Sun, 2018–2019
- Abhinav Das, 2018–2019
- Wenxian Zhang, 2017–2019
- Kengyan Lim, 2017–2019
- Jianlin Du, 2017–2018
- Sarah Schieferstein, 2017
- Fanbo Xiang, 2017

- Seungjun Cho, 2017
- Yirou Li, 2017
- Carolyn Nye, 2017
- Dingchen Yue, 2017
- Seo Taek Kong, 2016–2017
- Dennis Ryu, 2016–2017
- Malhar Jere, 2016–2017
- Taehun Ahn, 2016–2017
- Huozhi Zhou, 2015–2017
- Austin Benjamin, 2016
- Dickens Li, Chinese University of Hong Kong, 2016
- Sourya Basu, Indian Institute of Technology Kanpur, 2016
- Song Jianhan, Chinese University of Hong Kong, 2015
- Vei Wang Isaac Phua, Chinese University of Hong Kong, 2015
- Chien-Sheng Yang, 2015
- Evan Phibbs, 2015–2016
- You Guan, 2015–2016
- Mayank Amencherla, 2014–2016
- Hongyang Bai, 2014–2015
- Rex Chen, 2014–2015
- Zhizhou He, 2014–2015
- Kaiqing Zhang, Tsinghua University, 2014–2015
- Matt Tsao, Johnny Duan, Dominic Gentile, Konrad Wrobel, and Matthew Yang, basketball analytics with Oklahoma City Thunder franchise in NBA, 2014–2015
- Mohammad Saad, 2014
- Sara Mouradian, Prarthna Desai, Derek Ju, John Kucharczyk, Asad Moten, Allin Resposo, and Andrew Ang [graduate advisor], synthetic biology, 2008

Selected Media and Popular Attention

Artificial Intelligence

- Appeared in the Youtube Originals Series, *The Age of AI*, hosted by Robert Downey, Jr.

Mathematical Theory of Creativity

- “A Christmas menu dreamed up by a robot,” *BBC News*, 19 Dec. 2018.
- “You are what AI cooks,” *Wired Japan*, Jul. 2017.
- “The neural food network,” *Science Node*, 14 Jun. 2017.
- “Want to Understand Creativity? Enlist an AI collaborator,” *Wired*, 6 Jun. 2017.
- “Tina Fey, Bill Nye, Ellen Burstyn and More Join 10th Anniversary World Science Festival Lineup,” *Broadway World*, 22 May 2017.
- “Lav Varshney,” *Wired Japan*, Jul. 2015.
- “What's Cooking with Chef Watson? An Interview with Lav Varshney and James Briscione,” *IEEE Pervasive Computing*, Oct.-Dec. 2015.

Social Media

- “Big cities have fewer tweeters per capita,” *Scientific American (60 Second Science)*, 26 Feb. 2018.
- “Twitter-Aktivität in Großstädten unerwartet gering,” *Computerwelt*, 22 Feb. 2018.
- “Tweeting in cities lower than expected: Study,” *Indian Express*, 21 Feb. 2018.
- “Facebook has figured out how to stem the revenge porn tide,” *Inc.*, 25 Apr. 2017.
- “How Facebook is planning to eliminate the revenge porn problem,” *Fox News*, 18 Apr. 2017.

- “How Foursquare knew before almost anyone how bad things were for Chipotle,” *The Washington Post*, 28 Apr. 2016.

Impact Sourcing

- “Illinois faculty achievements add up to big impact,” *Big Ten Network*, May 2016.

Olfactory Signal Processing

- “Like sound-cancelling headphones, kinda sorta, for odors,” *BetaBoston*, 29 Jul. 2014.
- “White noise for your nose cancels pungent aromas,” *New Scientist*, 30 Oct. 2014.
- “‘White noise for your NOSE’: Scientists develop formula that neutralises ANY odour,” *The Daily Mail*, 31 Oct. 2014.
- “‘White Noise’ for your nose cancels out nasty odors,” *Huffington Post*, 2 Nov. 2014.
- “Stink killer saves your nose from stench,” *Discovery News*, 3 Nov. 2014.
- “The mathematical formula that could get rid of bad smells,” *The Independent (i100)*, 3 Nov. 2014.
- “Active odour cancellation,” *BBC World Service (Newsday)*, 4 Nov. 2014.
- “Smell cancelling ‘white noise’ developed by scientists, will eliminate putrid aromas,” *Inquisitr*, 4 Nov. 2014.
- “Now, use ‘olfactory white’ formula to cancel out all ‘nasty’ odours,” *Zee News*, 4 Nov. 2014.
- “Scientists find a way to eliminate smells by creating ‘white noise’ for the nose,” *Tech Times*, 5 Nov. 2014.
- “Smell-canceling odors are like white noise for your nose,” *Gizmag*, 6 Nov. 2014.
- “A bad smell, turn on the smell cancellation device,” *Design & Trend*, 8 Nov. 2014.
- “Bose for the nose,” *Motor Trend*, Apr. 2015.

Culinary Computational Creativity

Featured in:

- L. Dormehl, *Thinking Machines: The Quest for Artificial Intelligence—And Where It’s Taking Us Next*, Tarcher Perigee, 2017.
- A. McAfee and E. Brynjolfsson, *Machine, Platform, Crowd: Harnessing Our Digital Future*, New York: W. W. Norton & Company, 2017.
- “I.B.M. looks ahead to a sensor revolution and cognitive computers,” *New York Times*, 17 Dec. 2012.
- “Computers will taste, smell and hear within five years, IBM predicts,” *Washington Post*, 17 Dec. 2012.
- “Computers that will see, hear, smell: Next, world domination?,” *Los Angeles Times*, 17 Dec. 2012.
- “Like broccoli for chocolate: IBM predicts,” *Bloomberg*, 17 Dec. 2012.
- “IBM predicts: Cognitive computers that feel and smell, within the next five years,” *Popular Science*, 17 Dec. 2012.
- “Computers will hear, smell and taste within five years says IBM,” *Wired*, 18 Dec. 2012.
- “Computers may someday beat chefs at creating flavors we crave,” *National Public Radio (All Things Considered)*, 25 Dec. 2012.
- “New computers aim to tackle taste buds,” *ABC News*, 3 Jan. 2013.
- “Future computer system could be your personal chef,” *CNN*, 10 Jan. 2013.
- “And now, from I.B.M., Chef Watson,” *New York Times*, 27 Feb. 2013.
- “IBM computer helps make meal for Wall Street analysts,” *San Jose Mercury News*, 28 Feb. 2013.
- “Jeopardy-winning Chef Watson will take your order now,” *NBC News*, 4 Mar. 2013.
- “Cooking with I.B.M.: The Synthetic Gastronomist,” *New Yorker*, 9 Apr. 2013.
- “Try the first recipe devised by IBM’s supercomputer chef,” *Fast Company*, 29 Apr. 2013.
- “Want to invent a new recipe? IBM has a computer for that,” *Time Magazine*, 29 Apr. 2013.
- “IBM’s Taste Master,” *IEEE Spectrum*, 31 May 2013.
- “Se il computer batte lo chef: Lav Varshney ha un obiettivo: creare software che sforni ricette innovative,” *Focus*, Sept. 2013.

- “Digital Gastronomy: When an IBM algorithm cooks, things get complicated—and tasty,” *Wired*, Oct. 2013.
- “New answer from IBM's Watson: A recipe for swiss-thai fusion quiche,” *Technology Review*, 3 Oct. 2013.
- “IBM Research is whipping up new recipes sure to whet the appetite,” *IBM Systems Magazine*, Oct. 2013.
- “The secret ingredient in computational creativity,” *Technology Review*, 11 Nov. 2013.
- “A new kind of food science: How IBM is using big data to invent creative recipes,” *Wired (Empirical Zeal)*, 16 Nov. 2013.
- “Artificial intelligence reduces perturbation and disturbance related to table d’hôte,” *Scientific American (Food Matters)*, 1 Jan. 2014.
- “How that ‘Jeopardy!’ super computer could make IBM billions,” *ABC News*, 9 Jan. 2014.
- “The number crunch: Will Big Data transform your life - or make it a misery?,” *The Independent*, 19 Jan. 2014.
- “Computer recipe generator,” *Radio New Zealand (This Way Up)*, 25 Jan. 2014.
- “How big data is revolutionizing the food industry,” *Wired (Innovation Insights)*, 14 Feb. 2014.
- “Artificial intelligence; tasty real-world results,” *The News-Gazette*, 23 Feb. 2014.
- “Watch out, creative class: Robots are coming after your jobs, too,” *Quartz*, 28 Feb. 2014.
- “IBM's Watson returns with exciting new project — a food truck,” *Yahoo! News*, 5 Nov. 2014.
- “University professor programs artificial chef,” *The Daily Illini*, 6 Mar. 2014.
- “SXSW: Which way to South by South West? Trackdown Snowden or follow Watson, IBM's food truck,” *The Gospel Herald*, 8 Mar. 2014.
- “AI On The Rise Weekly: IBM’s AI chef, robots discerning bad breath and more on Google Glass,” *SiliconAngle*, 3 June 2014.
- “How IBM's Chef Watson actually works,” *Bon Appétit*, 30 June 2014.
- “IBM's Watson is out with its own barbecue sauce,” *NPR*, 3 July 2014.
- “Doughnut compute: A cookbook by Watson, IBM’s AI machine,” *Digital Trends*, 9 April 2015.

Optimality of Psychophysical Scales

- “What number is halfway between 1 and 9? Is it 5 — or 3?,” *MIT Tech Talk*, 5 Oct. 2012.
- “What's halfway between 1 and 9? Kids and scientists say 3,” *Huffington Post*, 22 Oct. 2012.
- “Does the brain work logarithmically,” *IEEE Spectrum (Techwise Conversations)*, 8 Nov. 2012.
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