MIT Media Lab, E15-384B
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Tara Sowrirajan

Education

Ph.D. **Harvard University**, *Computer Science*, Cambridge, MA, USA.
2016 – Present **Thesis:** *Understanding drivers of behavior and predicting outcomes on social networks.*

Description: Modeling social influence using a heterogeneous, group-level framework with large-scale behavioral data to uncover temporal evolution of social dynamics and target network interventions. Analyzing inequity that only becomes emergent at the network-level in order to design socioeconomic networks to promote fairness.

- **Advisor:** Alex 'Sandy' Pentland (MIT Media Lab, MIT IDSS, MIT Sloan School of Management)

M.Sc. **Harvard University**, *Computer Science*, Cambridge, MA, USA.
2016 – 2018

B.Sc. **California Institute of Technology**, *Computer Science (with Honors)*, Pasadena, CA, USA.
2012 – 2016

Research Experience

2018 - Present **MIT Media Lab**, *Human Dynamics Group*.
Working on modeling and understanding human behavior with large-scale behavioral datasets with network theory and machine learning

2018 - Present **MIT IDSS: Institute for Data Systems and Society**, *Connection Science*.
Understanding network effects on systematic inequity and building methods to promote fairness in economic systems

2016 - 2018 **Harvard University**, *Computer Science, SEAS*.
Using reinforcement learning and control theory methods for optimal control in the artificial pancreas

2015 **California Institute of Technology, University of Southern California**, *Developmental Biology and Bioengineering*.
Designed a microfluidic device to capture unpredictable, never before recorded events in embryo development and perform precise molecular analysis at desired time points

2014 **California Institute of Technology, University of Southern California**, *Developmental Biology and Bioengineering*.
Modeled and quantified gonocyte movement to support the phenomenon of cytoplasmic shedding as a mechanism through which gonocytes migrate to the walls of seminiferous tubules

2013 **NASA Jet Propulsion Laboratory**, *Biochemistry*.
Performed molecular imprinting on inverse hydrogel photonic crystals such that upon exposure to viable endospores, a sensor would exhibit a rapid, visible color change

Publications

[6] D. Holtz, M. Zhao, S. G. Benzell, C. Cao, M. A. Rahimian, J. Yang, J. Allen, A. Collis, A. Moehring, **T. Sowrirajan**, D. Ghosh, Y. Zhang, P. Dhillon, C. Nicolaides, D. Eckles, and S. Aral. "Interdependence and the Cost of Uncoordinated Responses to COVID-19." ***Proceedings of the National Academy of Sciences 117 (33) 19837-19843, August 18, 2020.***

Media Coverage: Los Angeles Times, MSNBC, The Boston Globe, Yahoo Finance, The Hill, TechRepublic, WGBH

[5] **T. Sowrirajan**, A. Pentland, and T. Lau. "Distributed inference of multi-dimensional, homophilous communities for temporal behavior prediction." ***Netsci: International School and Conference on Network Science 2020***

[4] **T. Sowrirajan**, A. Pentland, and T. Lau. "Distributed inference of multi-dimensional, homophilous communities for temporal behavior prediction." $\mathbf{6^{th}}$ ***International Conference on Computational Social Science:*** $\mathbf{IC^2S^2}$ ***2020***

[3] Y. Leng, **T. Sowrirajan**, and A. Pentland. "Interpretable Stochastic Block Influence Model: measuring social influence among homophilous communities." Second round review with minor revisions at ***Nature Palcomms: Humanities and Social Sciences Communications***

[2] Y. Leng, **T. Sowrirajan**, and A. Pentland. "Measuring heterogeneous social influence within and across homophilous communities." $\mathbf{5^{th}}$ ***International Conference on Computational Social Science:*** $\mathbf{IC^2S^2}$ ***2019***

[1] A. Chakrabarty, S. Zavitsanou, **T. Sowrirajan**, F. J. Doyle III, and E. Dassau "Getting IoT-ready: The face of next generation artificial pancreas systems." in The Artificial Pancreas: Current Situation and Future Directions, R. S. Sanchez-Pena and D. R. Chernavvsky, Editors, Elsevier, 2019.

Publications in Progress

[3] **T. Sowrirajan**, A. Pentland, and T. Lau. "Distributed inference of latent communities for temporal behavior prediction." In preparation for submission to ***Proceedings of the National Academy of Sciences***

[2] **T. Sowrirajan**, S.C. Lera, A. Lipton, and A. Pentland. "Impact Based Taxation." In preparation for submission to ***Scientific Reports***

[1] **T. Sowrirajan**, S.C. Lera, and A. Pentland. "Group-level influence in response to disaster events." Work in progress.

Teaching Experience

Fall 2018 **Advanced Scientific Computing: Numerical Methods**, *Applied Math 205*, Harvard University.
Double teaching fellow appointment: held weekly office hours, graded problem sets and exams, mentored and evaluated final projects.

Fall 2017 **Introduction to Theoretical Computer Science**, *Computer Science 121*, Harvard University.
Teaching fellow: taught weekly recitation sections, designed homework problems and solutions, held weekly office hours, and graded assignments and exams.

2017-2018 **Pedagogy Group**, Harvard University.
Weekly reading group on science and engineering pedagogy in the School of Engineering and Applied Sciences.

Fall 2016 **Teaching Practicum**, Harvard University.
Teaching and pedagogy course in School of Engineering and Applied Sciences.

Talks

Sept 2020 **Distributed inference of latent communities for temporal behavior prediction**, *Netsci: International School and Conference on Network Science 2020*, Rome, Italy.

July 2020 **Distributed inference of latent communities for temporal behavior prediction**, *IC2S2: International Conference on Computational Social Science 2020*, Massachusetts Institute of Technology, Cambridge, MA, USA.

March 2020 **Analysis and Control of Excessive Wealth Accumulation**, *MIT Connection Science*, Cambridge, MA, USA.

July 2019 **Measuring heterogeneous social influence within and across homophilous communities**, *IC2S2: International Conference on Computational Social Science 2019*, Amsterdam, Netherlands.

June 2019 **Measuring heterogeneous social influence within and across homophilous communities**, LUM University, Bari, Italy.

June 2019 **Measuring heterogeneous social influence within and across homophilous communities**, *Swisscom*, Bern, Switzerland.

August 2014 **Live Imaging Reveals Novel Dynamic Events in Transitioning Mouse Gonocytes**, *World Congress of Reproductive Biology: 2014*, Edinburgh, UK.

Workshops and Courses

Dec 2018 **Israel Institute for Advanced Studies**, *The 3rd Advanced School in Computer Science and Engineering: Blockchains and Cryptocurrencies*.

Jan 2018 **Harvard IACS: Institute for Applied and Computational Science**, *Disrupting Healthcare through Machine Learning Data Challenge*.

Awards & Honors

Dec 2018 Awarded travel and participation grant by the Israel Institute for Advanced Studies for the 3rd Advanced School in Computer Science and Engineering: Blockchains and Cryptocurrencies.

June 2015 Robert and Delta Noland Summer Internship Awardee for research: Microfluidic Embryo-Trap Array for Live Imaging and Molecular Analysis, *California Institute of Technology*.

June 2014 Samuel P. and Frances Krown Summer Undergraduate Research Fellowship (SURF) Fellow Awardee for research: Live Imaging Reveals Novel Dynamic Events in Transitioning Mouse Gonocytes, *California Institute of Technology*.

Jan 2014 Awarded First Place Overall at KAUST (King Abdullah University of Science and Technology) Undergraduate Research Competition for research: Inverse Opal Hydrogel Sensors for the Detection of Endospore Viability.

June 2013 Dr. Harry B. Gray SURF Fellow Awardee for research: Inverse Opal Hydrogel Sensors for the Detection of Endospore Viability, *California Institute of Technology, NASA Jet Propulsion Laboratory*.

Community Activities

- Harvard Graduate Women in Science and Engineering Mentoring Program Co-Chair - 2017 to 2018
- Harvard Graduate School Leadership Institute - Fall 2016
- Preceptorship at the Children's Hospital Los Angeles in summer of 2014
- Worked with Rancho Los Amigos National Rehabilitation Center to develop a wheelchair technology mount
- Over 450 hours of volunteering:
  - National Jewish Hospital at an immunology laboratory
  - University of Colorado Hospital at various departments including Day Surgery and Endoscopy
  - The Expedition Health Exhibit at the Denver Museum of Nature and Science
  - Played fusion music (Indian and Western) for some charity events
  - Science and math camp for underserved children
  - Smoky Hill Library
- Tutored at Kumon Math and Reading and Saccomano Academics