Irene Y. Chen

Contact Information
iychen@mit.edu
http://irenechen.net

Education

Massachusetts Institute of Technology, Cambridge, MA. 2016 –
Ph.D., Computer Science and Electrical Engineering
Advisor: David Sontag

Harvard-MIT Health Sciences and Technology, Cambridge, MA. 2017 –
Certificate, General Education Medical Sciences

Harvard University, Cambridge, MA 2010 – 2014
S.M., Computational Science and Engineering
A.B., Applied Mathematics

Honors

Rising Star in AI - Harvard University CRCS	2021
Rising Star in EECS - University of California Berkeley	2020
Rising Star in Machine Learning - University of Maryland	2020
NeurIPS Top 400 Reviewer	2019
Seth J. Teller Memorial Award for Excellence, Inclusion and Diversity	2018
Paul & Daisy Soros Fellowship Finalist	2018
Google Travel Grant	2018
Women in Machine Learning Travel Grant	2017
Derek Bok Certificate of Distinction in Teaching	2014
Grace Hopper Conference for Women in Computing Scholarship	2013
Program for Research in Markets and Organizations Fellow	2012
National Merit Scholarship	2010
Athletes for a Better World Medal	2010

Work Experience

Research Intern, **Microsoft Research**	2020
Machine Learning Engineer, **Dropbox**	2015 – 2016
Chief of Staff, **Dropbox**	2015
Data Scientist, **Dropbox**	2014 – 2015
Software Engineer Intern, **Knewton**	2013
Enumerator, **US Census Bureau**	2010

Research Experience

Clinical machine learning 2016 –
Advised by David Sontag (MIT)

Advance understanding of health through improved machine learning methods for disease progression, subtype discovery, fairness, and causal inference. Medical applications include health knowledge graph discovery, congestive heart failure, and intensive care unit mortality prediction. In collaboration with Beth Israel Deaconess Medical Center and Independent Blue Cross.

Normative appeal for causal models 2020
Advised by Solon Baracos and Hal Duamé III (Microsoft Research, FATE Group)

Formalize public policy motivations for causal models over predictive models and identify lack in current methodological advances of machine learning. Address gaps between the two, particularly related to questions of intervention, culpability, and aligned incentives for strategic behavior.

Digital discrimination of hosts on Airbnb 2012 – 2014
Supervised by Michael Luca and Ben Edelman (Harvard Business School)

Quantified causal monetary penalty paid by landlords due to racial and gender discrimination on online accommodations website Airbnb. Scraped website for pricing and profile data. Built statistical model to measure market imbalance and demand-side discrimination.

Publications

Bharti Khurana, David Song, Rahul Ujrathi, Abhishek Keraliya, Cambden P. Bay, **Irene Y. Chen**, Steven E. Seltzer, Giles W. Boland, Mitchel B. Harris, George S.M. Dyer, and Paul Tornetta III, "Recognizing isolated ulnar fracture as a potential marker for Intimate Partner Violence." *Journal of the American College of Radiology*, February 2021.

Irene Y. Chen, Emily Alsentzer, Hyesun Park, Richard Thomas, Babina Gosangi, Rahul Gujrathi, and Bharti Khurana. "Intimate Partner Violence and Injury Prediction from Radiology Reports." *Pacific Symposium of Biocomputing 2021* (**spotlight presentation**).

Laleh Seyyed-Kalantari, Guanxiong Liu, Matthew McDermott, **Irene Y. Chen**, Marzyeh Ghassemi. "CheXclusion: Fairness gaps in deep chest X-ray classifiers." *Pacific Symposium of Biocomputing 2021* (**spotlight presentation**).

Irene Y. Chen*, Shalmali Joshi*, Marzyeh Ghassemi, Rajesh Ranganath. "Probabilistic Machine Learning in Health." *Annual Reviews in Biomedical Data Science 2021.*

Irene Y. Chen, Emma Pierson, Shalmali Joshi, Sherri Rose, Kadija Ferryman, Marzyeh Ghassemi. "Ethical AI for Health." *Annual Reviews in Biomedical Data Science 2021.*

Irene Y. Chen, Monica N. Agrawal, Steven Horng, David Sontag. "Robustly Extracting Medical Knowledge from electronic Health Records: A Case Study of Learning a Health Knowledge Graph." *PSB 2020* (**oral presentation**, top 22% of submitted papers).

Irene Y. Chen, Shalmali Joshi, Marzyeh Ghassemi. "Treating Health Disparities with Artificial Intelligence." *Nature Medicine*, January 2020.

Marzyeh Ghaseemi, Tristan Naumann, Peter Schulam, Andrew L. Beam, **Irene Y. Chen**, Rajesh Ranganath. "A Review of Challenges and Opportunities in Healthcare for Machine Learning." *AMIA Informatics Summit 2020.*

Brett Beaulieu-Jones, Samuel G. Finlayson, Corey Chivers, **Irene Y. Chen**, Matthew McDermott, Jaz Kandola, Adrian V. Dalca, Andrew Beam, Madalina Fiterau, Tristan Naumann. "Trends and Focus of Machine Learning Applications for Health Research." *JAMA Network Open*, October 2019.

Tom J. Pollard, **Irene Y. Chen**, Jenna Wiens, Steven Horng, Danny Wong, Marzyeh Ghassemi, Heather Mattie, Emily Lindmeer, Trishan Panch. "Turning the crank for machine learning: ease, at what expense?" *Lancet Digital Health*, September 2019.

Marzyeh Ghassemi, Tristan Naumann, Peter Schulam, Andrew L. Beam, **Irene Y. Chen**, Rajesh Ranganath. "Practical Guidance on Artificial Intelligence for Healthcare Data." *Lancet Digital Health*, August 2019.

Irene Y. Chen, Peter Szolovits, Marzyeh Ghassemi. "The Disparate Impacts of Medical and Mental Health with AI." *AMA Journal of Ethics*, February 2019.

Andy Coravos, **Irene Y. Chen**, Ankit Gordhandas, Ariel Dora Stern. "We should treat algorithms like prescription drugs." *Quartz*, February 2019.

Irene Y. Chen, Fredrik D. Johansson, David Sontag. "Why is my classifier discriminatory?" *NeurIPS 2018*, (**spotlight presentation**, top 4% of submitted papers). Presented at the Women in Machine Learning workshop at *NeurIPS 2017*. (***covered by NPR/WGBH, MIT News***)

Preprints & Working Papers

Irene Y. Chen, Rahul G. Krishnan, David Sontag. "Clustering Censored Multivariate Time-Series for Disease Phenotyping." Under review (***covered by MIT News***).

Laleh Seyyed-Kalantari, Guanxiong Liu, Matthew McDermott, **Irene Y. Chen**, Marzyeh Ghassemi. "Medical imaging exacerbates disparities in underdiagnosis." Under review.

Irene Y. Chen, Marzyeh Ghassemi. "Caveats and Conditions for Deployed Model Audits." Under review.

Abstracts

Irene Y. Chen, Heather Berlin, William Boag, David Sontag, Peter Szolovits, Pravin Kamble, Song Wang, Kaisa Elomaa, and Michelle Luo. "Applying Machine Learning to Large Databases to Predict Nonresponse to Conventional Treatment in Patients with Ulcerative Colitis." International Society for Pharmacoeconomics and Outcomes Research, May 2021.

David Sing, George Dyer, Mitchel B. Harris, Camden Bay, **Irene Y. Chen**, Steven E. Seltzer, Giles W. Boland, Paul Tornetta III, Bharti Khurana. "Recognizing Intimate Partner Violence: Defensive Ulnar Fractures." Radiology Society of North America, 2020. (***featured paper, oral presentation, covered by Fox News***)

Teaching & Mentoring

MIT

Mentor, Undergraduate Research Opportunities Program - Sol Garnica	2021
Teaching Assistant, ML for Healthcare (6.94/7.00 on student evaluations)	2019
Mentor, Black in AI	2019
Mentor, Undergraduate Research Opportunities Program - Loc Trinh	2018

Harvard University

Teaching Fellow, Data Structures and Algorithms	2014
Teaching Fellow, Linear Algebra and Differential Equations	2013
Teaching Fellow, Multivariate Calculus	2012
Course Assistant, Microeconomic Theory	2012
Course Assistant, Linear Algebra and Real Analysis II	2012
Course Assistant, Linear Algebra and Real Analysis I	2011

Invited Talks

UT-Austin Fairness in Machine Learning Panel	2021
TWiML AI Podcast	2021
MIT J-Clinic Equity Conference	2021
Harvard CRCS Rising Star in AI in Health	2021
University of British Columbia CPSC 490	2021
Health at Scale	2021
Society for Epidemiologic Research	2021
Mechanism Design for Social Good	2020
Trustworthy Machine Learning Initiative	2020
University of Maryland Rising Stars in ML	2020
New York University Guest Lecture	2020
Tufts CS Colloquium	2020
Microsoft Research Breakthroughs in AI	2020
Harvard Tech Review	2020
Columbia University Guest Lecture	2020
University of Toronto CSC2541HS Guest Lecture	2020
Harvard Medical School Equity and Social Justice Lecture Series	2020
Harvard Computer Science Laboratory Tea	2020
Harvard Department of Bioinformatics	2020
MIT Structure and Interpretation of Deep Networks Guest Lecture	2020
PSB Oral Presentation	2020
Independent Blue Cross	2019
MIT HST.953 Guest Lecture	2019
Data and Society Meeting on Fair ML in Health	2019
UMass Lowell	2019
Digital Medicine Society Webinar	2019
Harvard Bioethics Colloquium	2019
Harvard Clinical Informatics Lecture Series	2019
MIT SP.250 Guest Lecture	2019
MIT Machine Learning Retreat	2019
UMass Amherst	2019
Google Fairness Reading Group	2019
Microsoft Research / MIT CSAIL Research Summit	2019
University of Toronto CSC2541HS Guest Lecture	2019
NeurIPS Spotlight Talk	2018
Google Fairness in Machine Learning Workshop	2018
PyCon	2016

Service

Conference Organizer

Organizer, ML for Health Workshop at NeurIPS	2018 – 2020
Tutorials Chair, ACM CHIL	2020, 2021
Founding Organizer, Fair ML for Health Workshop at NeurIPS	2019

Program Committee

Neural Information Processing Systems (NeurIPS)	2018 – 2020
International Conference on Artificial Intelligence and Statistics (AISTATS)	2017, 2019, 2021
International Conference in Machine Learning (ICML)	2019 – 2020
Conference on Uncertainty in Artificial Intelligence (UAI)	2021
AMIA Clinical Informatics	2019
Fairness, Accountability, Transparency (FAT*)	2019
Machine Learning for Health Workshop at NeurIPS	2017, 2019
Black in AI Workshop at NeurIPS	2019, 2020
Healthcare Systems, Population Health, and the Role of Health-Tech Workshop at ICML	2020
Practical ML for the Developing World Workshop at ICLR	2020
Pacific Symposium for Biocomputing (PSB)	2019
New in ML Workshop at NeurIPS	2019
Women in Machine Learning Workshop at NeurIPS	2017
Consequential Decision Making in Dynamic Environments Workshop at NeurIPS	2020

Leadership

Founding Organizer, MIT Machine Learning Retreat	2019
Founding Organizer, MIT AI Ethics Reading Group	2018
President, MIT Graduate Women In Course 6	2017
Senior Class Committee, Harvard College	2014
Head Peer Advising Fellow, Harvard College	2014

University and Department Service

PhD Admissions Reviewer, MIT EECS	2020
Non-resident Tutor, Cabot House, Harvard College	2017 – 2020

Languages & Hobbies

English (native), French (proficient), Mandarin Chinese (proficient)
Long distance running (ran 2018 Boston Marathon)