

Christina X. Ji

PhD student in computer science
Massachusetts Institute of Technology
cji@mit.edu, Offices E25-545, 32-G424

RESEARCH INTERESTS

- Characterize variation in how patients are treated
- Evaluate reinforcement learning policies
- Model longitudinal patient progression

CURRENT POSITION

Sep 2019 – **PhD student.** *MIT clinical machine learning group.* Advisor: David Sontag.

EDUCATION

MEng Computer science and engineering. Massachusetts Institute of Technology.
2019 Advisor: David Sontag. Thesis: Modeling progression of Parkinson's disease.

BS Computer science and engineering. Massachusetts Institute of Technology.
2019 Minor in mathematics.

RESEARCH EXPERIENCE

- Jun 2021 – **Applied research data science intern.** *LinkedIn.*
Aug 2021 Performed causal analysis to measure effect of engagement with LinkedIn Learning features on overall engagement and revenue.
Collaborated with other data science teams and business partners.
- Sep 2018 – **Master's student.** *MIT clinical machine learning group.*
Aug 2019 Defined data-driven Parkinson's disease outcomes using observational data. Predicted outcomes using survival analysis models. Demonstrated reduction in clinical trial sample size. Explored learning patient trajectories and subtypes.
- Jun 2018 – **Intern.** *Philips research.* Cambridge, MA.
Aug 2018 Forecasted vital signs to enhance hemodynamic instability prediction using neural networks and mutual information measures. Focused on deployment.
- Feb 2018 – **Undergraduate researcher.** *MIT clinical machine learning group.*
May 2018 Demonstrated the challenges of evaluating treatment policies from reinforcement learning using observational data due to insufficient variation in clinical practice, unobserved confounding, and poor function approximation.
- Jan 2018 **Intern.** *IBM research.* Cambridge, MA.
Created data-driven survival analysis models for predicting complication onset in diabetes. Added feature interactions to an objective function accounting for observed and censored samples.

Sep 2017 – **Undergraduate researcher.** *MIT laboratory for computational physiology.*
Dec 2017 Applied an interpretable deep learning model to mortality prediction in the intensive care unit.

FELLOWSHIP

Sep 2019 – **Abdul Latif Jameel fellowship for machine learning and health solutions**
May 2020 Full graduate tuition and stipend

PAPER

Mar 2021 **Trajectory inspection: a method for iterative clinician-driven design of reinforcement learning studies.** Christina X Ji*, Michael Oberst*, Sanjat Kanjilal, and David Sontag. American medical informatics association 2021 virtual informatics summit. *equal contribution

CONFERENCE POSTERS

Oct 2019 **Modeling progression of Parkinson's disease.** Christina X. Ji, Rahul G. Krishnan, and David Sontag.
MIT institute for medical engineering and science industrial group symposium. Cambridge, MA.
Preliminary progress presented at *MIT data science and artificial intelligence laboratory launch.* Cambridge, MA. Oct 2018.

Apr 2018 **Dangers of applying off-policy reinforcement learning to healthcare.** Christina X. Ji, Fredrik D. Johansson, and David Sontag.
MIT statistics and data science conference. Cambridge, MA.

Apr 2018 **Data-driven survival analysis models with feature interactions for risk prediction in healthcare.** Christina X. Ji, Bin Liu, and Kenney Ng.
Northeast computational health summit. Cambridge, MA.
Also presented at *Women in data science.* Cambridge, MA. Feb 2018.

PAPER REVIEWING

Oct 2020 Machine learning for health workshop at neural information processing systems 2020.

Oct 2020 American medical informatics association 2021 virtual informatics summit.

Oct 2019 Bioinformatics journal.

COURSEWORK

Graduate
EECS Machine learning, Machine learning for healthcare, Optimization, Algorithms for inference, Bayesian inference, Probability theory

Undergraduate
EECS Algorithms I & II, Software construction, Compilers, Systems, Deep learning for biology

Mathematics Real analysis, Econometrics, Probability, Linear algebra,
Differential equations

Biology Cancer biology, Cell biology, Genetics, Biochemistry, Organic chemistry

TEACHING AND MENTORING

Sep 2020 – **Graduate application assistance program mentor.** *MIT.*
Help minority students with MIT EECS PhD application.

Sep 2019 – **Undergraduate/master's research co-mentor.** *MIT.*
May 2021 Student: Justin Lim. Project: Characterizing diabetes treatment variation.

Feb 2018 – **Lab assistant.** *MIT undergraduate machine learning course.*
May 2018 Answered student questions during lab sections and office hours. Ensured
students understood material during checkoffs.

Aug 2016 – **Associate advisor.** *MIT.*
May 2020 Advised first year undergraduates on class selection. Checked in throughout
the year. Helped students with transition back to campus after leave. Featured
associate advisor of May 2019.

COMMUNITY SERVICE

Jun 2020 – **Committee member.** *MIT Ashdown dormitory brunch.*
Organize virtual social events. Package and deliver food.

Jan 2020 – **Co-vice president of orientation and visit days.** *MIT EECS graduate student
association.*
Organize logistics, including live streaming, bus rental, student volunteers,
escorting visiting students, and handouts.

Feb 2019 – **Site coordinator.** *MIT singing for service.*
May 2019 Reached out to senior homes and homeless shelters in the Boston area to
coordinate logistics for our singing performances.

May 2018 – **Committee chair.** *Eta Kappa Nu (HKN) outreach.*
May 2019 HKN is the EECS undergraduate honor society. Helped committee members
coordinate events for computer science and first year undergraduates and
admitted high school students. Wrote and managed committee budget.

Oct 2017 – **Committee member.** *Eta Kappa Nu (HKN) outreach.*
May 2018 Hosted student-faculty dinners. Facilitated discussions.

Aug 2017, **Orientation captain.** *MIT.*
Aug 2018 Guided new orientation leaders through two full-day trainings each year.
Served as a liaison between orientation leaders and staff.

Aug 2016, **Orientation leader.** *MIT.*
Aug 2017, Facilitated discussions with new first years on college life. Helped run events
Aug 2018 during orientation week.

EARLIER POSITIONS

Nov 2016 – **Undergraduate researcher.** *MIT Koch institute for integrative cancer*
Aug 2017 *research.*

Induced aneuploidy in mice to observe how cancer arises. Conducted experiments with tissue cultures and microscopy.

Jun 2016 – **Intern.** *Janssen pharmaceuticals.* Spring House, PA.

Aug 2016 Worked with scientists to develop a user-friendly application to store, view, and analyze data using Java and MySQL.

Jan 2016 – **Undergraduate researcher.** *MIT computational biology group.*

May 2016 Performed statistical analyses to correct for bias in measuring allele-specific expression using CHIP-seq and RNA-seq data.

Jun 2015 – **Student researcher.** *Stanford cancer computational and systems biology*
Aug 2015 *group.*

Compared performance of multiple insertion-deletion callers for paired tumor-normal samples.