

Chandler Squires

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CONTACT INFORMATION

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RESEARCH INTERESTS

Methodology in statistics and machine learning: Causal structure learning, experimental design, representation learning, treatment effect estimation
Scientific applications: Cellular biology, genomics, healthcare.

EDUCATION

Ph.D. Candidate, Electrical Engineering and Computer Science **Expected June 2024**

Thesis Advisors: David Sontag, Caroline Uhler

M.Eng., Electrical Engineering and Computer Science
Massachusetts Institute of Technology, Cambridge, MA, USA

September 2019

Thesis Advisor: Caroline Uhler

GPA: 5.0/5.0

B.S., Electrical Engineering and Computer Science
Massachusetts Institute of Technology, Cambridge, MA, USA

June 2018

GPA: 4.9/5.0

SELECTED PUBLICATIONS

1. **Squires, C.***, Seigal, A.*, Bhate, S., Uhler, C. *Linear Causal Disentanglement via Interventions*, [ICML 2023](#).
2. **Squires, C.**, Uhler, C. *Causal Structure Learning: a Combinatorial Perspective*, [JoFCM 2022](#).
3. Belyaeva, A., Cammarata, L., Radhakrishnan, A., **Squires, C.**, Yang, K., Shivashankar, G.V., Uhler C. *Causal Network Models of SARS-CoV-2 Expression and Aging to Identify Candidates for Drug Repurposing*, [Nature Communications 2021](#).
4. **Squires, C.**, Magliacane, S., Greenewald, K., Katz, D., Kocaoglu, M., Shanmugam, K. *Active Structure Learning of Causal DAGs via Directed Clique Trees*, [NeurIPS 2020](#).
5. **Squires, C.**, Wang, Y., Uhler, C. *Permutation-Based Causal Structure Learning with Unknown Intervention Targets*, [UAI 2020](#).

TEACHING EXPERIENCE

Massachusetts Institute of Technology

1. Instructor: *6.S091, Causality* **January 2023**
[Link to lecture notes and recordings](#).
2. Teaching Assistant: *6.437, Inference and Information* **Spring 2019**
3. Teaching Assistant: *6.438, Algorithms for Inference* **Fall 2018**

MENTORSHIP

1. Ryan Welch, BS **2023 –**
2. Cathy Cai, BS + MEng **2023 –**
3. Álvaro Ribot, BS, now PhD at Harvard University **2022 – 2023**
4. Sathwick Karnik, BS, now MEng at MIT **2020 – 2022**
5. Michael Truell, BS, now at Cursor **2021 – 2023**
6. Eshaan Nichani, MEng, now PhD at Princeton University **2020 – 2021**
7. Neha Prasad, BS + MEng, now at Valo **2020 – 2021**
8. Annie Yun, BS + MEng, now at HRT **2020 – 2021**
9. Joshua Amaniampong, BS, now at HAP Capital **2020 – 2021**

INVITED TALKS	<ol style="list-style-type: none"> 1. Causal Representation Learning Workshop at NeurIPS upcoming 2. Molecule Modeling and Drug Discovery (M₂D₂) Talk Series 2023 3. SIAM Conference on Optimization 2023 4. Colloquium on When Causal Inference meets Statistical Analysis 2023 5. Principles of Distribution Shift (PODS) Workshop at ICML 2022 6. Institute for Mathematical Sciences (IMS) Annual Meeting 2022 7. Workshop on Interactive Causal Learning 2022 8. Simons Institute Causality Bootcamp 2022 9. AI4Science Colloquium 2021
HONORS AND AWARDS	<ol style="list-style-type: none"> 1. NSF Graduate Research Fellowship Program (NSF-GRFP) 2020 – 2023 2. Sloan-MIT UCEM Fellowship 2019 – 3. MIT Presidential Fellowship 2019 – 2020 4. David Adler Electrical Engineering MEng Thesis Award (2nd place) 2020
SERVICE	<p>Reviewer, NeurIPS, ICML, UAI, AISTATS, JMLR, JOCI. 2019–</p> <p>Communication fellow, MIT EECS Communication Lab 2021–</p> <p>Provided one-on-one coaching to over 100 EECS students and postdocs, on technical communications such as conference papers, oral presentations, posters, and fellowship applications.</p> <p>Ran four workshops on scientific writing and presentation skills for EECS graduate students.</p> <p>Developed a new workshop, <i>Effective Communication for Collaborative Research</i>, based on interviews with over a dozen graduate students and postdoctoral researchers.</p> <p>Application reviewer, MIT Summer Research Program (MSRP). 2022</p> <p>Application reviewer, AI+D Graduate Admissions, EECS, MIT. 2022</p> <p>Lead organizer, Causal Representation Learning Reading Group 2021 – 2022</p> <p>Organized a bi-weekly reading group with members from over 20 universities.</p> <p>Mentor, Mentor Advocate Program (MAP), MIT 2020 – 2021</p> <p>Attended the MIT Office of Minority Education training on cultural competency in academia.</p> <p>Held monthly one-on-one meetings with two MIT undergraduate students, giving advice on classes, internships, and time management.</p> <p>Committee Member, LIDS, MIT 2019 – 2021</p> <p><i>Social committee (2019 – 2020)</i>: Organized weekly social gatherings for the Laboratory for Information Decision Systems (LIDS) community. Hosted a barbecue, a pub night, and several other events, including virtual game nights during the COVID-19 pandemic.</p> <p><i>Tea talk committee (2020 – 2021)</i>: Organized weekly student talks over Zoom.</p> <p>Treasurer, IDSS Student Council, MIT 2019 – 2020</p>
SOFTWARE	<p>causal_{dag}: A Python package for the creation, manipulation, and learning of causal models. Lead developer. ★124 on Github.</p>

REFEREED
PUBLICATIONS

1. Zhang, J., Cammarata, L., **Squires, C.**, Sapsis, T., Uhler, C. *Active Learning for Optimal Intervention Design in Causal Models*. **Nature Machine Intelligence 2023** [arXiv].
2. Sturma, N., **Squires, C.**, Drton, M., Uhler, C. *Unpaired Multi-Domain Causal Representation Learning*, **NeurIPS 2023** [arXiv].
3. Zhang, J., Greenewald, K., **Squires, C.**, Srivastava, A., Shanmugam, K., Uhler, C. *Identifiability Guarantees for Causal Disentanglement from Soft Interventions*, **NeurIPS 2023** [arXiv].
4. Agrawal, R., **Squires, C.**, Prasad, N., Uhler, C. *The DeCAMFounder: Non-Linear Causal Discovery in the Presence of Hidden Variables*, **JRSS-B 2023** [arXiv].
5. **Squires, C.***, Seigal, A.*, Bhate, S., Uhler, C., *Linear Causal Disentanglement via Interventions*, **ICML 2023** [arXiv].
6. **Squires, C.***, Yun, A.*, Nichani, E., Agrawal R., Uhler C. *Causal Structure Discovery between Clusters of Nodes Induced by Latent Factors*, **CLear 2022** [arXiv].
7. **Squires, C.***, Shen, D.*, Agarwal, A., Shah, D., Uhler, C. *Causal Imputation via Synthetic Interventions*, **CLear 2022** [arXiv].
8. **Squires, C.**, Uhler, C. *Causal Structure Learning: a Combinatorial Perspective*, **JoFCM, 2022** [arXiv].
9. Zhang, J., **Squires, C.**, Uhler C. *Matching a Desired Causal State via Shift Interventions*, **NeurIPS 2021** [arXiv].
10. Belyaeva, A., **Squires, C.**, Uhler. C. *DCI: learning causal differences between gene regulatory networks*, **Bioinformatics 2021** [pdf].
11. Belyaeva, A., Cammarata, L., Radhakrishnan, A., **Squires, C.**, Yang, K., Shivashankar, G.V., Uhler C. *Causal Network Models of SARS-CoV-2 Expression and Aging to Identify Candidates for Drug Repurposing*, **Nature Communications 2021** [arXiv].
12. **Squires, C.**, Magliacane, S., Greenewald, K., Katz, D., Kocaoglu, M., Shanmugam, K. *Active Structure Learning of Causal DAGs via Directed Clique Trees*, **NeurIPS 2020** [arXiv].
13. **Squires, C.**, Wang, Y., Uhler, C. *Permutation-Based Causal Structure Learning with Unknown Intervention Targets*, **UAI 2020** [arXiv].
14. **Squires, C.***, Bernstein, D.*, Saeed, B.*, Uhler, C. *Ordering-based causal structure learning in the presence of latent variables*, **AISTATS 2020** [arXiv].
15. Katz, D., Shanmugam, K., **Squires, C.**, Uhler, C. *Size of Interventional Markov Equivalence Classes in random DAG models*, **AISTATS 2019** [arXiv].
16. Agarwal, R., **Squires, C.**, Yang, K., Uhler, C. *ABCD-Strategy: Budgeted Experimental Design for Targeted Causal Structure Discovery*, **AISTATS 2019** [arXiv].
17. Wang, Y., **Squires, C.**, Belyaeva, A., Uhler, C. *Direct Estimation of Differences in Causal Graphs*, **NeurIPS 2018** [arXiv].

PREPRINTS

1. Truell, M, Hütter J.C., **Squires, C.**, Zwiernik P., Uhler C. (2021) *Maximum Likelihood Estimation for Brownian Motion Tree Models based on One Sample* [arXiv].