Chandler Squires

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RESEARCH INTERESTS

Methodology in statistics and machine learning: Causal structure learning, experimental design, representation learning.
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 **September 2019**
Massachusetts Institute of Technology, Cambridge, MA, USA

  Thesis Advisor: Caroline Uhler

  GPA: 5.0/5.0

B.S., Electrical Engineering and Computer Science **June 2018**
Massachusetts Institute of Technology, Cambridge, MA, USA

  GPA: 4.9/5.0

SELECTED PUBLICATIONS

1. **Squires, C.***, Seigal, A.*, Bhate, S., Uhler, C. (2023), *Linear Causal Disentanglement via Interventions*, ICML 2023 [arXiv].

2. **Squires, C.**, Uhler, C. (2022). *Causal Structure Learning: a Combinatorial Perspective*, JoFCM [arXiv].

3. Belyaeva, A., Cammarata, L., Radhakrishnan, A., **Squires, C.**, Yang, K., Shivashankar, G.V., Uhler C. (2021) *Causal Network Models of SARS-CoV-2 Expression and Aging to Identify Candidates for Drug Repurposing*, Nature Comm. [arXiv].

4. **Squires, C.**, Magliacane, S., Greenewald, K., Katz, D., Kocaoglu, M., Shanmugam, K. (2020). *Active Structure Learning of Causal DAGs via Directed Clique Trees*, NeurIPS 2021 [arXiv].

5. **Squires, C.**, Wang, Y., Uhler, C. (2020). *Permutation-Based Causal Structure Learning with Unknown Intervention Targets*, UAI 2020 [arXiv].

6. Bernstein, D.*, Saeed, B.*, **Squires, C.***, Uhler, C. (2020). *Ordering-based causal structure learning in the presence of latent variables*, AISTATS 2020 [arXiv].

7. Agarwal, R., **Squires, C.**, Yang, K., Uhler, C. (2019). *ABCD-Strategy: Budgeted Experimental Design for Targeted Causal Structure Discovery*, AISTATS 2019 [arXiv].

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. Fareed Sheriff, BS	**2023 −**
	3. Cathy Cai, BS + MEng	**2023 −**
	4. Álvaro Ribot, BS, now at Harvard University	**2022 − 2023**
	5. Sathwick Karnik, BS	**2020 − 2022**
	6. Michael Truell, BS	**2021 − 2023**
	7. Eshaan Nichani, MEng, now at Princeton University	**2020 − 2021**
	8. Neha Prasad, BS + MEng, now at Valo	**2020 − 2021**
	9. Annie Yun, BS + MEng, now at HRT	**2020 − 2021**
	10. Joshua Amaniampong, BS, now at HAP Capital	**2020 − 2021**

INVITED TALKS		
	1. Causal Representation Learning Workshop at NeurIPS	**upcoming**
	2. Molecule Modeling and Drug Discovery (M_2D_2) 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 Colloqium	**2021**

SERVICE

Reviewer, NeurIPS, ICML, UAI, AISTATS, JMLR, JOCI. **2019–**

Communication coach, MIT EECS Communication Lab **2021–**

Provided over 100 hours of one-on-one feedback to EECS students and postdocs, focusing on technical communications such as conference papers, oral presentations, posters, and fellowship applications.

Ran workshops on scientific writing and presentation skills for EECS graduate students.

Organizer, Causal Representation Learning Reading Group **2021 − 2022**

Organized a bi-weekly reading group with members from over 20 universities

Treasurer, IDSS Student Council, MIT **2020 − 2021**

Tea talk committee member, LIDS, MIT **2020 − 2021**

Organized a series of weekly student talks within the LIDS community

Social committee member, LIDS, MIT **2019 − 2020**

Organized weekly social gatherings for the LIDS community; hosted barbecues, pub nights, game nights, and other events.

REFEREED
PUBLICATIONS

1. Agrawal, R., **Squires, C.**, Prasad, N., Uhler C. (2023). *The DeCAMFounder: Non-Linear Causal Discovery in the Presence of Hidden Variables*, JRSS-B [arXiv].

2. **Squires, C.***, Seigal, A.*, Bhate, S., Uhler, C. (2023), *Linear Causal Disentanglement via Interventions*, ICML 2023 [arXiv].

3. **Squires, C.***, Yun, A.*, Nichani, E., Agrawal R., Uhler C. (2022). *Causal Structure Discovery between Clusters of Nodes Induced by Latent Factors*, CLeaR 2022 [arXiv].

4. **Squires, C.***, Shen, D.*, Agarwal, A., Shah, D., Uhler, C. *Causal Imputation via Synthetic Interventions*, CLeaR 2022 [arXiv].

5. **Squires, C.**, Uhler, C. (2022). *Causal Structure Learning: a Combinatorial Perspective*, JoFCM [arXiv].

6. Zhang, J., **Squires, C.**, Uhler C. (2021). *Matching a Desired Causal State via Shift Interventions*, NeurIPS 2021 [arXiv].

7. Belyaeva, A., **Squires, C.**, Uhler. C (2021). *DCI: learning causal differences between gene regulatory networks*, Bioinformatics 2021 [pdf].

8. Belyaeva, A., Cammarata, L., Radhakrishnan, A., **Squires, C.**, Yang, K., Shivashankar, G.V., Uhler C. (2021) *Causal Network Models of SARS-CoV-2 Expression and Aging to Identify Candidates for Drug Repurposing*, Nature Comm. [arXiv].

9. **Squires, C.**, Magliacane, S., Greenewald, K., Katz, D., Kocaoglu, M., Shanmugam, K. (2020). *Active Structure Learning of Causal DAGs via Directed Clique Trees*, NeurIPS 2021 [arXiv].

10. **Squires, C.**, Wang, Y., Uhler, C. (2020). *Permutation-Based Causal Structure Learning with Unknown Intervention Targets*, UAI 2020 [arXiv].

11. Bernstein, D.*, Saeed, B.*, **Squires, C.***, Uhler, C. (2020). *Ordering-based causal structure learning in the presence of latent variables*, AISTATS 2020 [arXiv].

12. Katz, D., Shanmugan, K., **Squires, C.**, Uhler, C. (2019). *Size of Interventional Markov Equivalence Classes in random DAG models*, AISTATS 2019 [arXiv]

13. Agarwal, R., **Squires, C.**, Yang, K., Uhler, C. (2019). *ABCD-Strategy: Budgeted Experimental Design for Targeted Causal Structure Discovery*, AISTATS 2019 [arXiv].

14. Wang, Y., **Squires, C.**, Belyaeva, A., Uhler, C. (2019). *Direct Estimation of Differences in Causal Graphs*, NeurIPS 2018 [arXiv].

PREPRINTS

1. Zhang, J., **Squires, C.**, Greenewald, K., Srivastava, A., Shanmugam, K., Uhler, C. (2023). *Identifiability Guarantees for Causal Disentanglement from Soft Interventions*, [arXiv].

2. Sturma, N., **Squires, C.**, Drton, M., Uhler, C. (2023). *Unpaired Multi-Domain Causal Representation Learning*, [arXiv].

3. Zhang, J., Cammarata, L., **Squires, C.**, Sapsis, T., Uhler, C. (2022), *Active Learning for Optimal Intervention Design in Causal Models.* [arXiv].

4. 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].

INDUSTRY
EXPERIENCE

Summer Researcher, Microsoft Research, Redmond, WA, USA   **June 2021–August 2021**

Developed a contrastive learning schema for improved multivariate time-series prediction in settings with causal relationships between variables.

Summer Researcher, IBM, Cambridge, MA, USA   **June 2019–August 2019**

Developed theoretical characterization of optimal experimental design strategies for learning causal graphical models.

Data Science Intern, nference, Cambridge, MA, USA   **January 2018–August 2018**

Led both frontend and backend development for two new apps aimed at protein annotation and alignment and patient segmentation; analyzed custom statistical models of protein sequences