Patrick Lin

Curriculum Vitæ

Department of Computer Science
University of Illinois at Urbana-Champaign
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he/him/they/them

Research Interests

Discrete/computational topology and geometry, with focus on surface-embedded graphs. Graph theory and algorithms, primarily structural perspectives. Generally, applying topological methods to achieve efficient algorithms.

Education

University of Illinois at Urbana-Champaign 2015–present
Ph.D. in Computer Science (in progress). *Advisor: Jeff Erickson*.

NYU Polytechnic School of Engineering 2011–2015
M.S. in Mathematics. *Advisor: Lisa Hellerstein*.
B.S. in Computer Science, with honors.

Employment

Teaching Assistant (Instructor of Record), University of Illinois at Urbana-Champaign 2020–present

Software Engineering Intern, Google, Inc. 2018, 2019, 2020

Teaching Assistant and Research Assistant, University of Illinois at Urbana-Champaign 2015–2019

Awards and Honors

List of Teachers Ranked as Excellent by Their Students Fall 2015*, Spring 2018*,
(*outstanding rating) Fall 2019*, Summer 2020

Outstanding Teaching Assistant Fall 2016, Fall 2019

Richard T. Cheng Endowed Fellowship 2015–2016

Research

Most of the papers listed below can be found at https://patrickl.in/. Papers are listed *once*, even if they have multiple versions. Following standard practice in theoretical computer science, coauthors are listed *alphabetically*.

Conference Publications

[1] How to Morph Graphs on the Torus. With Erin Wolf Chambers, Jeff Erickson, and Salman Parsa. To appear in the 32nd Annual ACM-SIAM Symposium on Discrete Algorithms (2021). arXiv:2007.07927.

[2] A Toroidal Maxwell–Cremona–Delaunay Correspondence. With Jeff Erickson. In *Proceedings of the 36th International Symposium on Computational Geometry (SoCG)*, pages 40:1–40:17, 2020. arXiv:2003.10057. Preliminary version in *Abstracts of the Computational Geometry: Young Researchers Forum*, 2019. Full version invited to special issue of *Journal of Computational Geometry*.

[3] Scenario Submodular Cover. With Nathaniel Grammel, Lisa Hellerstein, and Devorah Kletenik. In *Proceedings of the 14th International Workshop on Approximation and Online Algorithms (WAOA)*, pages 116–128, 2016. arXiv:1603.03158.

[4] Discrete Stochastic Submodular Maximization. With Lisa Hellerstein and Devorah Kletenik. In *Proceedings of the 9th International Conference on Algorithms and Complexity (CIAC)*, pages 235–248, 2015. arXiv:1504.02146.

Abstracts, Preprints, Technical Reports, etc.

[5] A Note on Toroidal Maxwell–Cremona Correspondences. Preprint, September 2020. arxiv:2009.12205.

[6] Boolean Function Evaluation Over A Sample. With Lisa Hellerstein and Devorah Kletenik. In *NIPS Workshop on Discrete and Combinatorial Problems in Machine Learning (DISCML)*, 2014. Sketches results improved and corrected in [3].

Invited Talks

Maxwell-Cremona meets the Torus [2], 2020
Virtual seminar on algebraic matroids and rigidity theory. Online.

Maxwell-Cremona meets the Torus [2], 2019
Saint Louis University. Missouri, USA.

Conference Talks and Workshop Presentations

A Toroidal Maxwell-Cremona Correspondence [2], 2020
36th International Symposium on Computational Geometry (SoCG'20). Online.

A Toroidal Maxwell-Cremona Correspondence [2], 2019
Cmmputational Geometry: Young Researcher's Forum (CG:YRF'19). Oregon, USA.

Boolean Function Evaluation Over A Sample [6], 2014
NIPS Workshop on Discrete and Combinatorial Problems in Machine Learning (DISCML'14). Montreal, CA.

Teaching

University of Illinois at Urbana Champaign

Instructor of Record:

CS 374	Intro to Algorithms & Models of Computation [tentative]	Spring 2021
CS 173	Discrete Structures	Summer 2020*, Fall 2020

Teaching Assistant:

CS 173	Discrete Structures	Fall 2019**†
CS 498 ABD	Algorithms for Big Data	Spring 2019
CS 374	Intro to Algorithms & Models of Computation	Fall 2015**, Spring 2018**†
CS 473	Algorithms	Spring 2016, Fall 2016

*Rated excellent based on student evaluations, as reported in the university's "List of Teachers Ranked as Excellent by Their Students". **Rated *outstanding* (top 10% campus-wide).
†Head Teaching Assistant.

NYU Polytechnic School of Engineering

Teaching Assistant:

CS 6753	Theory of Computation	Fall 2014
CS 5303	Introduction to Programming and Problem Solving	Fall 2013
CS 6003	Foundations of Computer Science	Fall 2013
MA 2312/2322	Discrete Mathematics	Fall 2012, Spring 2013

Mentorship

Current students

- Alexandra Jakucewicz, PURE Mentee for Fall 2020
- Shalin Mehta, PURE Mentee for Fall 2020

Service

Reviewing and Refereeing

- **Referee** for *Discrete & Computational Geometry*.
- **External Reviewer** for *Foundations of Software Technology and Theoretical Computer Science* (2017), *Symposium on Foundations of Computer Science* (2018), *Symposium on Computational Geometry* (2018).