Uthsav Chitra

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Website: https://uthsavc.github.io

Education

Princeton University, Princeton, New Jersey — *Sept 2018 - May 2023 (expected)*
Advisor: Ben Raphael
Ph.D. Candidate in Computer Science
M. A. in Computer Science — *Received Sept 2020*

Brown University, Providence, Rhode Island — *Sept 2013 - May 2017*
Sc.B. Mathematics, A.B. Computer Science, A.B. Applied Math — GPA: 4.0/4.0

Publications

** denotes joint first authorship*

Belayer: Modeling distinct cell type clusters and continuous variation of expression in spatial transcriptomics from layered tissues.
Cong Ma*, **Uthsav Chitra***, Shirley Zhang, Benjamin J. Raphael. *International Conference on Research in Computational Molecular Biology (RECOMB) 2022.*

NetMix2: Unifying network propagation and altered subnetworks.
Uthsav Chitra*, Tae Yoon Park*, Benjamin J. Raphael. *International Conference on Research in Computational Molecular Biology (RECOMB) 2022.*

Quantifying and Reducing Bias in Maximum Likelihood Estimation of Structured Anomalies.
Uthsav Chitra, Kimberly Ding, Jasper C. H. Lee, Benjamin J. Raphael. *International Conference on Machine Learning (ICML) 2021.*

NetMix: A network-structured mixture model for reduced-bias estimation of altered subnetworks.
Matthew A Reyna*, **Uthsav Chitra***, Rebecca Elyanow, Benjamin J. Raphael. *Journal of Computational Biology (JCB) 2021.* Previously appeared at the *International Conference on Research in Computational Molecular Biology (RECOMB) 2020.*

Analyzing the Impact of Filter Bubbles on Social Network Polarization. **Uthsav Chitra**, Christopher Musco. *ACM International Web Search and Data Mining Conference (WSDM) 2020.*

Random Walks on Hypergraphs with Edge-Dependent Vertex Weights. **Uthsav Chitra**, Benjamin J. Raphael. *International Conference on Machine Learning (ICML) 2019.*

Committee Selection is More Similar Than You Think: Evidence from Avalanche and Stellar. Tarun Chitra, **Uthsav Chitra**. *Manuscript, 2019.*

Honors and Awards

Best Reviewer Award, International Conference on Machine Learning (ICML) — *2021, 2022*
NSF Graduate Research Fellowship — *2020*
Jerome Stein Memorial Award, Brown University Applied Math Department — *2017*
- Given to the top two students who "show outstanding potential in an interdisciplinary area that involves applied mathematics."

Phi Beta Kappa, Brown University (elected junior year, top 2% of class) — *2016*
Top 200, William Lowell Putnam Math Competition — *2015*
First Place, Brown University Hartshorn-Hypatia Math Examination — *2013*
Semi-finalist, Siemens Competition (research project in number theory) — *2012*

Teaching

Instructor/Curriculum Developer, Princeton Prison Teaching Initiative *2019-Present*
- Teaching college-accredited math classes at NJ state prisons.
- Developing Java programming course to be taught in NJ state prisons.

Teaching Assistant/Grader, Brown University
- **MATH 1560:** Number Theory *Spring 2016, Spring 2017*
- **CSCI 1570:** Design and Analysis of Algorithms *Fall 2015, Fall 2016*
- **CSCI 1450:** Probability in Computing *Spring 2015*
- **CSCI 0530:** Linear Algebra for CS *Fall 2014*
- **MATH 1530:** Abstract Algebra *Spring 2014*

Counselor, Program in Mathematics for Young Scientists (PROMYS) *Summer 2014*
- Counselor for summer program that introduces high school students to higher math through elementary number theory.

Teaching Assistant, Art of Problem Solving *2012-2016*
- Assisted online, real-time math classes in algebra, number theory, combinatorics, and geometry.

Talks

NetMix2: Unifying network propagation and altered subnetworks
Conference on Research in Computational Molecular Biology (RECOMB) *May 2022*

NetMix: A network-structured mixture model for reduced-bias estimation of altered subnetworks
Conference on Research in Computational Molecular Biology (RECOMB) *June 2020*
Princeton University Generals Exam *May 2020*

Analyzing the Impact of Filter Bubbles on Social Network Polarization
ACM International Web Search and Data Mining Conference (WSDM) *February 2020*
KDD WISDOM Workshop *August 2019*

Random Walks on Hypergraphs with Edge-Dependent Vertex Weights
SIAM Conference on Discrete Mathematics *June 2022*
Princeton University Generals Exam *May 2020*
International Conference of Machine Learning (ICML) *June 2019*

Students Advised/Mentored

Sunay Joshi, Princeton math undergraduate *2022-present*
- *Statistical models for differential abundance estimation in single-cell data*

Madelyne Xiao, Princeton CS PhD student *2022-present*
- *Accounting for covariates in statistical tests of somatic mutations in cancer*

Ahmed Shuaibi, Princeton QCB PhD student *2021-present*
- *Learning pairwise and higher-order interactions between somatic mutations in cancer*

Kimberly Ding, Princeton CS undergrad *2019-2021*
- Fall 2019: *Recommender Systems with Hypergraph Random Walks*
- Spring 2020: *Maximum Likelihood Estimation of Structured Anomalies*
- Senior Thesis 2020-2021: *Spatial-NetMix: Less Biased and More Flexible Anomaly Detection*
  - Received the "**Outstanding Computer Science Senior Thesis Prize**"

Shirley Zhang, Princeton CS undergrad/alumni *Summer 2020, 2021-2022*

- Summer 2020: *Learning DAGs using continuous optimization*
- 2021-2022: *Modeling spatial variation in spatial transcriptomics*
  - Received an **NSF Graduate Research Fellowship**

Service/Outreach

Conference Reviewing

RECOMB 2020 poster session, ICML 2021 (**Top 10% Reviewer**), NeurIPS 2021, ICML 2022 (**Top 10% Reviewer**)

Member, Princeton COS Ad Hoc Committee *2021-Present*
Member, Princeton Graduate Engineering Council *2021-Present*
Officer, Brown Math Departmental Undergraduate Group *2015-2017*
Mentor, Brown Matched Advising Program for Sophomores *2016-2017*

Work Experience

Software Engineer, Facebook *2017-2018*

- Built infrastructure, machine learning models, and data pipelines for improving ad quality.

Software Engineering Intern, Facebook *Summer 2016*

- Worked on various video ads projects.

Hobbies/interests: Bouldering, crosswords, biking.