

# UTHSAV CHITRA

35 Olden Street, Princeton, NJ 08540

Website: <https://uthsavc.github.io>

## EDUCATION

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**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

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\* denotes joint first authorship

**Belayer: Modeling discrete and continuous spatial variation in gene expression from spatially resolved transcriptomics.**

Cong Ma\*, **Uthsav Chitra\***, Shirley Zhang, Benjamin J. Raphael.

*Cell Systems* (2022). Previously appeared at the *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* (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

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**Siebel Scholar award**

2022

- Award of \$35,000 for students in their last year of graduate school.

<b>Best Reviewer Award</b> , International Conference on Machine Learning (ICML)	<i>2021, 2022</i>
<b>NSF Graduate Research Fellowship</b>	<i>2020</i>
<b>Jerome Stein Memorial Award</b> , Brown University Applied Math Department	<i>2017</i>
<ul style="list-style-type: none"> <li>Given to the top two students who “show outstanding potential in an interdisciplinary area that involves applied mathematics.”</li> </ul>	
<b>Phi Beta Kappa</b> , Brown University (elected junior year, top 2% of class)	<i>2016</i>
<b>Top 200</b> , William Lowell Putnam Math Competition	<i>2015</i>
<b>First Place</b> , Brown University Hartshorn-Hypatia Math Examination	<i>2013</i>
<b>Semi-finalist</b> , Siemens Competition (research project in number theory)	<i>2012</i>

## TEACHING

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<b>Instructor/Curriculum Developer</b> , Princeton Prison Teaching Initiative	<i>2019-Present</i>
<ul style="list-style-type: none"> <li>Teaching college-accredited math and computer science classes at NJ state prisons.</li> <li>Developed Java programming course for NJ state prisons.</li> </ul>	
<b>Teaching Assistant/Grader</b> , Brown University	
<ul style="list-style-type: none"> <li><b>MATH 1560</b>: Number Theory</li> </ul>	<i>Spring 2016, Spring 2017</i>
<ul style="list-style-type: none"> <li><b>CSCI 1570</b>: Design and Analysis of Algorithms</li> </ul>	<i>Fall 2015, Fall 2016</i>
<ul style="list-style-type: none"> <li><b>CSCI 1450</b>: Probability in Computing</li> </ul>	<i>Spring 2015</i>
<ul style="list-style-type: none"> <li><b>CSCI 0530</b>: Linear Algebra for CS</li> </ul>	<i>Fall 2014</i>
<ul style="list-style-type: none"> <li><b>MATH 1530</b>: Abstract Algebra</li> </ul>	<i>Spring 2014</i>
<b>Counselor</b> , Program in Mathematics for Young Scientists (PROMYS)	<i>Summer 2014</i>
<ul style="list-style-type: none"> <li>Counselor for summer program that introduces high school students to higher math through elementary number theory.</li> </ul>	
<b>Teaching Assistant</b> , Art of Problem Solving	<i>2012-2016</i>
<ul style="list-style-type: none"> <li>Assisted online, real-time math classes in algebra, number theory, combinatorics, and geometry.</li> </ul>	

## TALKS

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<b>NetMix2: Unifying network propagation and altered subnetworks</b>	
Conference on Research in Computational Molecular Biology (RECOMB)	<i>May 2022</i>
<b>NetMix: A network-structured mixture model for reduced-bias estimation of altered subnetworks</b>	
Conference on Research in Computational Molecular Biology (RECOMB)	<i>June 2020</i>
Princeton University Generals Exam	<i>May 2020</i>
<b>Analyzing the Impact of Filter Bubbles on Social Network Polarization</b>	
ACM International Web Search and Data Mining Conference (WSDM)	<i>February 2020</i>
KDD WISDOM Workshop	<i>August 2019</i>
<b>Random Walks on Hypergraphs with Edge-Dependent Vertex Weights</b>	
SIAM Conference on Discrete Mathematics	<i>June 2022</i>
Princeton University Generals Exam	<i>May 2020</i>
International Conference of Machine Learning (ICML)	<i>June 2019</i>

## STUDENTS ADVISED/MENTORED

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Sunay Joshi, Princeton math undergraduate	<i>2022-present</i>
<ul style="list-style-type: none"> <li><i>Statistical models for differential abundance estimation in single-cell data</i></li> </ul>	

Madelyne Xiao, Princeton CS PhD student	2022-present
<ul style="list-style-type: none"> <li>Accounting for covariates in statistical tests of somatic mutations in cancer</li> </ul>	
Ahmed Shuaibi, Princeton QCB PhD student	2021-present
<ul style="list-style-type: none"> <li>Learning pairwise and higher-order interactions between somatic mutations in cancer</li> </ul>	
Kimberly Ding, Princeton CS undergrad	2019-2021
<ul style="list-style-type: none"> <li>Fall 2019: <i>Recommender Systems with Hypergraph Random Walks</i></li> <li>Spring 2020: <i>Maximum Likelihood Estimation of Structured Anomalies</i></li> <li>Senior Thesis 2020-2021: <i>Spatial-NetMix: Less Biased and More Flexible Anomaly Detection</i> <ul style="list-style-type: none"> <li>Received the “<b>Outstanding Computer Science Senior Thesis Prize</b>”</li> </ul> </li> </ul>	
Shirley Zhang, Princeton CS undergrad/alumni	Summer 2020, 2021-2022
<ul style="list-style-type: none"> <li>Summer 2020: <i>Learning DAGs using continuous optimization</i></li> <li>2021-2022: <i>Modeling spatial variation in spatial transcriptomics</i> <ul style="list-style-type: none"> <li>Received an <b>NSF Graduate Research Fellowship</b></li> </ul> </li> </ul>	

## SERVICE/OUTREACH

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### Conference Reviewing

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

Member, Princeton COS Ad Hoc/Graduate Student 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

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<b>Software Engineer</b> , Facebook	2017-2018
<ul style="list-style-type: none"> <li>Built infrastructure, machine learning models, and data pipelines for improving ad quality.</li> </ul>	
<b>Software Engineering Intern</b> , Facebook	Summer 2016
<ul style="list-style-type: none"> <li>Worked on various video ads projects.</li> </ul>	

**Hobbies/interests:** **Bouldering**, puzzles, current events, making bad puns.