

# Trung Chau | Curriculum Vitae

✉ chauchitrung1996@gmail.com

• 🌐 <https://trungchaumath.github.io>

## Employment

### Chennai Institute of Mathematics

Postdoc

Mentor: Manoj Kummini

Chennai

November 2024–present

## Education

### University of Utah

Ph.D. student in Mathematics

Salt Lake City, Utah

2019–August 2024

Advisors: Anurag K. Singh and Srikanth B. Iyengar

Thesis: Barile-Macchia resolutions of monomial ideals and  $F$ -singularities of rings defined by commutator matrices and permanents

### University of Science - Vietnam National University

B.S. in Mathematics

Ho Chi Minh City, Vietnam

2014–2018

## Research

### Research Interests

Commutative Algebra, Algebraic Geometry, Combinatorics, and Algebraic Topology.

### Publications

11. Trung Chau, Huy Tài Hà, and Aryaman Maithani. *Powers of Edge Ideals of Graphs with Minimal Cellular Resolutions*, to appear in Electronic Journal of Combinatorics (2026).  
[arXiv].
10. Trung Chau. *Permanental ideals of symmetric matrices*, Proceedings of the American Mathematical Society (2026).  
[journal]. [arXiv].
9. Trung Chau, Kanoy Kunar Das, and Aryaman Maithani. *Edge ideals with linear quotients and without homological linear quotients*, Mediterranean Journal of Mathematics (2026).  
[journal]. [arXiv].
8. Trung Chau and Manoj Kummini. *Maximal minors of 1-generic matrices have rational singularities*, Archiv der Mathematik (2025).  
[journal]. [arXiv].
7. Trung Chau. *The  $F$ -singularities of algebras defined by permanents*, Collectanea Mathematica (2025).  
[journal]. [arXiv].
6. Trung Chau, Selvi Kara, and Kyle Wang. *Minimal Cellular Resolutions of Path Ideals*, Electronic Journal of Combinatorics (2025).  
[journal]. [arXiv].
5. Trung Chau, Nursel Erey, and Aryaman Maithani. *The Scarf complex of squarefree powers, symbolic powers of edge ideals, and cover ideals of graphs*, Communications in Algebra (2025).  
[journal]. [arXiv].
4. Trung Chau. *Minimal cellular resolutions of monomial ideals with five generators and their Artinian reductions*, Journal of Pure and Applied Algebra (2025).

[journal]. [arXiv].

3. Trung Chau, Huy Tài Hà, and Aryaman Maithani. *Monomial ideals with minimal generalized Barile-Macchia resolutions*, Vietnam Journal of Mathematics (2025).  
[journal]. [arXiv].
2. Trung Chau. *The F-regularity of algebraic sets related to commutator matrices*, Journal of Algebra (2024).  
[journal]. [arXiv].
1. Trung Chau and Selvi Kara. *Barile-Macchia resolutions*, Journal of Algebraic Combinatorics (2024).  
[journal]. [arXiv].

## Preprints

\* means undergraduates.

12. Trung Chau. *On Gotzmann thresholds and a conjecture of Bonanzinga and Eliasou*.  
Preprint. [arXiv]. (2025)
11. Trung Chau, Richie Sheng\*, Tim Tribone, and Deborah Wooton\*. *Scarf complexes of connected and path ideals*.  
Preprint. [arXiv]. (2025)
10. Trung Chau. *From neural codes to homological invariants: regularity and projective dimension of polarized neural ideals*.  
Preprint. [arXiv]. (2025)
9. Om Prakash Bhardwaj, Trung Chau, and Omkar Javadekar. *Projective monomial curves associated to numerical semigroups with multiplicity e, width e – 1, and embedding dimension e – 2*.  
Preprint. [arXiv]. (2025)
8. Trung Chau, Kanoy Kumar Das, Amit Roy, and Kamalesh Saha. *Admissible set and squarefree-power-like function with applications to squarefree symbolic powers*.  
Preprint. [arXiv]. (2025)
7. Trung Chau, Michale DeBellevue, Souvik Dey, K. Ganapathy, and Omkar Javadekar. *Periodicity of ideals of minors over some local rings and under deformation*.  
Preprint. [arXiv]. (2025)
6. Trung Chau, Kanoy Kumar Das, Animikha Dutta Dhar\*, Pranath S Karanth\*, and Aniruda Suswaram\*. *Trees whose path ideals have linear quotients*.  
Preprint. [arXiv]. (2025)
5. Trung Chau, Kanoy Kumar Das, Amit Roy, and Kamalesh Saha. *Admissible matchings and the Castelnuovo-Mumford regularity of square-free powers*.  
Preprint. [arXiv]. (2025)
4. Trung Chau, Richie Sheng\*, and Debbie Wooton\*. *Homological invariants of edge ideals of weighted oriented graphs*.  
Preprint. [arXiv]. (2025)
3. Trung Chau, Art M. Duval, Sara Faridi, Thiago Holleben, Susan Morey, Liana M. Ţega. *Realizing resolutions of powers of extremal ideals*.  
Preprint. [arXiv]. (2025)
2. James Cameron, Trung Chau, Sarasij Maitra, and Tim Tribone. *A family of simplicial resolutions which are DG-algebras*.  
Preprint. [arXiv]. (2024)
1. Trung Chau, Selvi Kara, and Augustine O’Keefe. *The MorseResolutions package for Macaulay2*.  
Preprint. [arXiv]. (2023)

## Research Stays, Awards, Grants, and Fellowships

### **Research Stay**

*1-week stay, invited by Professor Sara Faridi*

**Dalhousie University, Halifax**

*January 2026*

### **Research Stay**

*2-week stay, invited by Professor Huy Tai Ha*

**Tulane University, New Orleans**

*January 2026*

### **Research Stay**

*2-week stay, invited by Professor Dang Hop Nguyen*

**VAST, Hanoi**

*October 2025*

### **Thematic Program in Commutative Algebra and Applications**

*1-week stay*

**Fields Institute, Toronto**

*May 2025*

### **Research Stay**

*1-week stay, invited by Professor Sara Faridi*

**Dalhousie University, Halifax**

*August 2024*

### **SLMath's Summer Research in Mathematics**

*2-week stay with Art Duval, Sara Faridi, Thiago Holleben, Susan Morey, and Liana Sega*

**SLMath, Berkeley**

*June 2024*

### **Research Stay**

*1-week stay, invited by Professor Jeffrey Mermin*

**Oklahoma State University, Stillwater**

*October 2023*

### **Interactions Between Topological Combinatorics and Combinatorial CA**

*A one-week workshop hosted by BIRS*

*Invited Participant*

**BIRS, Banff, Canada**

*April 2023*

### **Department of Mathematics, University of Utah**

*Departmental Summer Funding*

*Summer 2023*

### **Research Stay**

*1-week stay, invited by Professor Huy Tài Hà*

**Tulane University, New Orleans**

*December 2022*

### **VIASM**

*Students Scholarship of National Program for The Development of Mathematics*

*2015–2017*

## Conferences Organized

### **JMM 2026 Special Session**

*Organizer*

SLMath Special Sessions on Combinatorial Aspects in Commutative Algebra

**Washington DC, USA**

*Spring 2026*

### **IAS school**

*Tutor*

Advanced Instructional School on the topic of André-Quillen and Hochschild cohomology functors

**Chennai, India**

*Fall 2024*

### **BRIDGES**

*Organizer*

Aimed towards early graduate students and advanced undergraduate students interested in geometric group theory, number theory, algebraic geometry and commutative algebra

**Salt Lake City, UT, USA**

*Summer 2022*

## Conference Presentations

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### Talks.....

#### **CAAC 2026**

*On second symbolic powers*  
Invited Speaker

**Halifax**

*January 2026*

#### **JMM 2026 Special Session**

*Extremal ideals and their universal nature*  
Invited Speaker

**Washington DC**

*January 2026*

#### **AMS Fall Eastern Virtual Sectional Meeting**

*Trees whose path ideals have linear resolution*  
Invited Speaker

**Virtual**

*October 2025*

#### **Mini-workshop on Invariants of Modules over Commutative Rings**

*The periodicity of Fitting ideals*  
Invited Speaker

**Hanoi**

*October 2025*

#### **Mathematical Congress of America 2025**

*Edge ideals without homological linear quotients*  
Invited Speaker

**Miami**

*July 2025*

#### **AMS Spring Western Sectional Meeting**

*Powers of edge ideals with minimal cellular resolutions*  
Invited Speaker

**San Francisco**

*May 2024*

#### **Canadian Mathematical Society's 2023 Winter Meeting**

*Barile-Macchia resolutions*  
Invited Speaker

**Montreal**

*December 2023*

#### **Algebra Day**

*The F-regularity of algebraic sets related to commutator matrices*  
Invited Speaker

**Phoenix**

*November 2023*

#### **AMS Spring Southeastern Sectional Meeting**

*The F-regularity of algebraic sets related to commutator matrices*  
Invited Speaker

**Atlanta**

*March 2023*

#### **AMS Fall Southeastern Sectional Meeting**

*Bridge resolutions*  
Invited Speaker

**Chattanooga**

*October 2022*

#### **The 11th VNU-HCMUS Scientific Conference**

*Counting integral points inside a polyhedron*  
Invited Speaker

**Ho Chi Minh City**

*November 2018*

### Posters.....

#### **KUMUNU**

*Barile-Macchia resolutions*  
Poster, Funded

**University of Missouri**

*September 2023*

#### **AlCoVE**

*Barile-Macchia resolutions*  
Poster

**Virtual**

*June 2023*

#### **Combinatorial Algebra meets Algebraic Combinatorics**

*Barile-Macchia resolutions*  
Poster, Funded

**University of Waterloo, Canada**

*January 2023*

#### **KUMUNU**

*Morse resolutions*  
Poster, Funded

**University of Nebraska at Lincoln**

*October 2022*

**PASCA**  
*Morse resolutions*  
Poster, Funded

**CIMAT, Guanajuato, Mexico**  
June 2022

## Seminar Organized

### Undergraduate Seminar in Algebra

Informal seminar, aimed towards fostering undergraduate research. Preprint [9] is one product of this seminar.

### Commutative Algebra Seminar

Aimed towards giving introductory talks in research topics to initiate collaboration

### BIKES, Commutative Algebra Graduate Student Seminar

**Chennai Mathematical Institute**  
Spring 2025

**Chennai Mathematical Institute**  
Spring 2025

**University of Utah**  
2021–2022

## Seminar Talks

### Research Talks.....

#### Algebra and Combinatorics Seminar

*Scarf path and connected ideals of graphs*

**Dalhousie University**  
January 2026

#### Algebra and Combinatorics Seminar

*Symbolic powers of extremal ideals*

**Tulane University**  
January 2026

#### Algebra and Number Theory Seminar

*Extremal ideals and applications*

**VAST**  
October 2025

#### Algebra Seminar

*The Frobenius singularities of permanental ideals*

**Chennai Mathematical Institute**  
February 2025

#### Algebra Seminar

*Knutson ideals*

**IIT Madras**  
February 2025

#### Combinatorial and Commutative Algebra Seminar

*Barile-Macchia resolutions*

**Oklahoma State University**  
October 2023

#### Combinatorial and Commutative Algebra Seminar

*Barile-Macchia resolutions*

**McMaster University**  
October 2023

#### Commutative Algebra Seminar

*The  $F$ -regularity of algebraic sets related to commutator matrices*

**Purdue University**  
September 2023

#### Algebra and Combinatorics Seminar

*Barile-Macchia resolutions*

**Tulane University**  
December 2022

#### Commutative Algebra Seminar

*Barile-Macchia resolutions*

**University of Utah**  
November 2022

### Graduate Student Seminars.....

#### Commutative Algebra Graduate Student Seminar, Syracuse University

Barile-Macchia resolutions for monomial ideals May 2024

#### CARES, Commutative Algebra Regional Expository Seminar (virtual)

Simplicial resolutions for monomial ideals December 2022

*D*-modules and an application April 2022

#### Commutative Algebra Graduate Student Seminar, University of Michigan

Showing  $F$ -purity and  $F$ -regularity through examples March 2023

## **BIKES, Commutative Algebra Graduate Student Seminar, University of Utah**

Discrete Morse Theory	<i>September 2023</i>
Principal radical systems	<i>April 2022</i>
Big Cohen-Macaulay modules and homological conjectures	<i>September 2022</i>
Multiple Morse resolutions of an ideal	<i>March 2022</i>
Cellular resolutions and hull resolutions	<i>March 2022</i>
Lyubeznik resolutions and Scarf complexes	<i>December 2021</i>
A quick look at the singularity category	<i>September 2021</i>
Modules of finite projective dimension in characteristic $p$	<i>February 2021</i>
Holonomic modules and applications	<i>November 2020</i>
A proof of Kunz's theorem using perfect rings	<i>July 2020</i>
Cohen-Macaulay rings	<i>September 2019</i>

## **General Math Talks**

Math Circle	<b>University of Utah</b>
Magic and maths	<i>2023</i>
<b>Undergraduate Student Colloquium</b>	<b>University of Utah</b>
Evolution of logical paradoxes	<i>2022</i>
<b>Graduate Student Colloquium</b>	<b>University of Utah</b>
Mathematics in Arts	<i>2020</i>

## **Teaching Experience**

### **Instructor of Record**

<b>Combinatorial Commutative Algebra</b> <i>Chennai Mathematical Institute</i>	co-teach with Omkar Javadekar <i>Spring 2026</i>
<b>Graduate Algebra 1</b> <i>Chennai Mathematical Institute</i>	co-teach with Professor Balaji <i>Fall 2025</i>
<b>MATH 3160: Applied Complex Variables</b> <i>University of Utah</i>	<i>Summer 2024</i>
<b>MATH 1090: Business Algebra</b> <i>University of Utah</i>	<i>Fall 2023</i>
<b>MATH 3070: Applied Statistics I</b> <i>University of Utah</i>	<i>Spring 2023</i>
<b>MATH 1070: Statistic Inference</b> <i>University of Utah</i>	<i>Fall 2022</i>
<b>MATH 3150: PDEs for Engineers</b> <i>University of Utah</i>	<i>Spring 2022</i>
<b>MATH 1210: Calculus 1</b> <i>University of Utah</i>	<i>Fall 2021</i>
<b>MATH 2270: Linear Algebra</b> <i>University of Utah</i>	<i>Summer 2021</i>
<b>MATH 1060: Trigonometry</b> <i>University of Utah</i>	<i>Spring 2021, Fall 2020</i>

## **Graduate Teaching Assistant**

### **MATH 2250: Differential Equations and Linear Algebra**

*University of Utah*

*Spring 2020, Fall 2019*

## **Grader**

### **MATH 6310: Modern Algebra 1**

*University of Utah*

*Fall 2022*

### **MATH 6040: Probability**

*University of Utah*

*Fall 2021*

### **MATH 6210: Real Analysis**

*University of Utah*

*Fall 2021*

### **MATH 6320: Modern Algebra 2**

*University of Utah*

*Spring 2021*

## **Service/Outreach**

### **University of Utah**

#### **Co-organizer**

Co-organized the 'Graduate Teacher Training Program' in Fall 2023 at the University of Utah. This week-long program is designed to train the incoming graduate students and postdoctoral fellows to improve their teaching and lab instruction skills, learn and understand issues pertaining to equity, diversity and inclusivity in Mathematics, and get accustomed to the department culture

Salt Lake City, Utah, USA

**Salt Lake City, Utah, USA**

*Fall 2023*

### **University of Utah**

#### **Graduate Student Advisory Committee**

- 2022–2023: **Cochair.**
- 2021–2022: **Recruitment committee.**

Welcoming prospective graduate students and organizing meetings with faculty for them.

- 2020–2021: **Co-chair of the peer mentoring program.**

Pairing incoming graduate students with advanced graduate students.

- 2020–2021: **Retention, Promotion, Tenure and Hiring.**

Make recommendations to the Department concerning promotion, tenure and retention of faculty members, and organize hiring teas with job candidates.

**Salt Lake City, Utah, USA**

*2020–2023*

### **University of Utah**

#### **Student Chapter of the Association for Women in Mathematics**

- 2023–2024: **Conference committee cochair.**

- 2021: **Presenter.**

Giving a talk to high-school students.

- 2020–2021: **Co-chair of mentoring program.**

Pairing advanced undergraduate students with first-year graduate students.

- 2020: **Facilitator of the 'What is math day?'**

Activity with middle school kids.

- 2020: **K-12 Outreach**

Middle school precalculus virtual homework help.

**Salt Lake City, Utah, USA**

*2020–2024*

### **University of Utah**

#### **Directed Reading Program in Mathematics**

Organizer

**Salt Lake City, Utah, USA**

*2021–2022*

#### **2019–2021: Graduate Student Mentor, University of Utah Directed Reading Program in Mathematics.**

Mentoring an undergraduate student for an independent reading projects.

- Mentee: Cameron Schmitter, Project: Category Theory

- Mentee: Kaden Richards, Project: Topology

- Mentee: Gracie Liu, Project: Chaos Theory

## Reviewer

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- o zbMATH
- o MathSciNet/AMS

## Referee/Peer-review

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Electronic Journal of Combinatorics, Illinois Journal of Mathematics, Journal of Algebraic Combinatorics, Special Matrices, Algebraic Combinatorics, Mathematica Scandinavica, Journal of Algebra and Applications.