

Trung Chau | Curriculum Vitae

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Employment

Chennai Institute of Mathematics

Postdoc

Mentor: Manoj Kummini

Chennai

November 2024–present

Education

University of Utah

Ph.D. student in Mathematics

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

Salt Lake City, Utah

2019–August 2024

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 Eliahou*.
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. Şega. *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 Insititute, 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 Segal

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

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

Chennai Mathematical Institute
Spring 2025

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

Commutative Algebra Seminar

Chennai Mathematical Institute
Spring 2025

Aimed towards giving introductory talks in research topics to initiate collaboration

BIKES, Commutative Algebra Graduate Student Seminar

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

General Math Talks

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

Teaching Experience

Instructor of Record

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

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** **Salt Lake City, Utah, USA**
 - *Co-organizer* *Fall 2023*

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
- **University of Utah** **Salt Lake City, Utah, USA**
 - *Graduate Student Advisory Committee* *2020–2023*
 - 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.
- **University of Utah** **Salt Lake City, Utah, USA**
 - *Student Chapter of the Association for Women in Mathematics* *2020–2024*
 - 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.
- **University of Utah** **Salt Lake City, Utah, USA**
 - *Directed Reading Program in Mathematics* *2021–2022*

Organizer
 - **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

- zbMATH
- MathSciNet/AMS

Referee/Peer-review

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