Trung Chau | Curriculum Vitae

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Education

Chennai Institute of Mathematics   **Chennai**
Postdoc   *October 2024–present*
Mentor: Manoj Kummini

University of Utah   **Salt Lake City, UT**
Ph.D. student in Mathematics   *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   **Ho Chi Minh City, Vietnam**
B.S. in Mathematics   *2014–2018*

Research

Research Interests

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

Publications (in order of acceptance)

8. Trung Chau. *The F-singularities of algebras defined by permanents*, Collectanea Mathematica (2025).
   journal version. arXiv version.

7. Trung Chau. *Permanental ideals of symmetric matrices*, to appear in Proceedings of the American Mathematical Society (2025).
   arXiv version.

6. Trung Chau, Selvi Kara, and Kyle Wang. *Minimal Cellular Resolutions of Path Ideals*, Electronic Journal of Combinatorics (2025).
   journal version. arXiv version.

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 version. arXiv version.

4. Trung Chau. *Minimal cellular resolutions of monomial ideals with five generators and their Artinian reductions*, Journal of Pure and Applied Algebra (2025).
   journal version. arXiv version.

3. Trung Chau, Huy Tài Hà, and Aryaman Maithani. *Monomial ideals with minimal generalized Barile-Macchia resolutions*, Vietnam Journal of Mathematics (2025).
   journal version. arXiv version.

2. Trung Chau. *The F-regularity of algebraic sets related to commutator matrices*, Journal of Algebra (2024).
   journal version. arXiv version.

1. Trung Chau and Selvi Kara. *Barile-Macchia resolutions*, Journal of Algebraic Combinatorics (2024).
   journal version. arXiv version.

Preprints

* means undergraduates.

10. Trung Chau, Michale DeBellevue, Souvik Dey, K. Ganapathy, and Omkar Javadekar. *Periodicity of ideals of minors over some local rings and under deformation.* arXiv:2507.05225. Submitted. (2025)

9. Trung Chau and Manoj Kummini. *Maximal minors of 1-generic matrices have rational singularities.* arXiv:2506.08385. Submitted. (2025)

8. Trung Chau, Kanoy Kumar Das, Animikha Dutta Dhar*, Pranath S Karanth*, and Aniruda Suswaram*. *Trees whose path ideals have linear quotients.* arXiv:2506.06209. Submitted. (2025)

7. Trung Chau, Kanoy Kumar Das, Amit Roy, and Kamalesh Saha. *Admissible matchings and the Castelnuovo-Mumford regularity of square-free powers.* arXiv:2504.11941. Submitted. (2025)

6. Trung Chau, Richie Sheng*, and Debbie Wooton*. *Homological invariants of edge ideals of weighted oriented graphs.* arXiv:2504.09703. Submitted. (2025)

5. Trung Chau, Kanoy Kunar Das, and Aryaman Maithani. *Edge ideals with linear quotients and without homological linear quotients.* arXiv:2503.11424. Submitted. (2025)

4. Trung Chau, Art M. Duval, Sara Faridi, Thiago Holleben, Susan Morey, Liana M. Şega. *Realizing resolutions of powers of extremal ideals .* arXiv:2502.09585. Submitted. (2025)

3. James Cameron, Trung Chau, Sarasij Maitra, and Tim Tribone. *A family of simplicial resolutions which are DG-algebras.* arXiv:2412.21120 . Submitted. (2024)

2. Trung Chau, Huy Tài Hà, and Aryaman Maithani. *Powers of Edge Ideals of Graphs with Minimal Cellular Resolutions.* arXiv:2404.04380 . Submitted. (2024)

1. Trung Chau, Selvi Kara, and Augustine O'Keefe. *The MorseResolutions package for Macaulay2.* arXiv:2307.03633. (2023)

Research Stays, Awards, Grants, and Fellowships

Research Stay	**Dalhousie University, Halifax**
1-week stay, invited by Professor Sara Faridi	*January 2026*
Research Stay	**Tulane University, New Orleans**
2-week stay, invited by Professor Huy Tai Ha	*January 2026*
Research Stay	**VAST, Hanoi**
2-week stay, invited by Professor Dang Hop Nguyen	*October 2025*
Thematic Program in Commutative Algebra and Applications	**Fields Insititute, Toronto**
1-week stay	*May 2025*
Research Stay	**Dalhousie University, Halifax**
1-week stay, invited by Professor Sara Faridi	*August 2024*
SLMath's Summer Research in Mathematics	**SLMath, Berkeley**
2-week stay with Art Duval, Sara Faridi, Thiago Holleben, Susan Morey, and Liana Sega	*June 2024*
Research Stay	**Oklahoma State University, Stillwater**
1-week stay, invited by Professor Jeffrey Mermin	*October 2023*

Interactions Between Topological Combinatorics and Combinatorial CA   **BIRS, Banff, Canada**
A one-week workshop hosted by BIRS   *April 2023*
Invited Participant

Department of Mathematics, University of Utah
Departmental Summer Funding   *Summer 2023*

Research Stay   **Tulane University, New Orleans**
1-week stay, invited by Professor Huy Tài Hà   *December 2022*

VIASM
Students Scholarship of National Program for The Development of Mathematics   *2015–2017*

Conferences Orgarized

JMM 2026 Special Session   **Washington DC, USA**
Organizer   *Spring 2026*
SLMath Special Sessions on Combinatorial Aspects in Commutative Algebra

IAS school   **Chennai, India**
Tutor   *Fall 2024*
Advanced Instructional School on the topic of André-Quillen and Hochschild cohomology functors

BRIDGES   **Salt Lake City, UT, USA**
Organizer   *Summer 2022*
Aimed towards early graduate students and advanced undergraduate students interested in geometric group theory, number theory, algebraic geometry and commutative algebra

Conference Presentations

Talks

JMM 2026 Special Session   **Washington DC, USA**
Extremal ideals and their universal nature   *January 2026*
Invited Speaker

AMS Fall Eastern Virtual Sectional Meeting   **Virtual**
Trees whose path ideals have linear resolution   *October 2025*
Invited Speaker

Mini-workshop on Invariants of Modules over Commutative Rings   **Hanoi**
The periodicity of Fitting ideals   *October 2025*
Invited Speaker

Mathematical Congress of America 2025   **Miami**
Edge ideals without homological linear quotients   *July 2025*
Invited Speaker

AMS Spring Western Sectional Meeting   **San Francisco**
Powers of edge ideals with minimal cellular resolutions   *May 2024*
Invited Speaker

Canadian Mathematical Society's 2023 Winter Meeting   **Montreal**
Barile-Macchia resolutions   *December 2023*
Invited Speaker

Algebra Day   **Arizona State University**
The F-regularity of algebraic sets related to commutator matrices   *November 2023*
Invited Speaker

AMS Spring Southeastern Sectional Meeting **Georgia Institute of Technology**
The F-regularity of algebraic sets related to commutator matrices *March 2023*
Invited Speaker

AMS Fall Southeastern Sectional Meeting **University of Tennessee at Chattanooga**
Bridge resolutions *October 2022*
Invited Speaker

The 11th VNU-HCMUS Scientific Conference **Ho Chi Minh City, Vietnam**
Counting integral points inside a polyhedron *November 2018*
Invited Speaker

Posters

KUMUNU **University of Missouri**
Barile-Macchia resolutions *September 2023*
Poster, Funded

AlCoVE **Virtual**
Barile-Macchia resolutions *June 2023*
Poster

Combinatorial Algebra meets Algebraic Combinatorics **University of Waterloo, Canada**
Barile-Macchia resolutions *January 2023*
Poster, Funded

KUMUNU **University of Nebraska at Lincohn**
Morse resolutions *October 2022*
Poster, Funded

PASCA **CIMAT, Guanajuato, Mexico**
Morse resolutions *June 2022*
Poster, Funded

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 Number Theory Seminar **VAST**
Extremal ideals and applications *October 2025*

Algebra Seminar **Chennai Mathematical Institute**
The Frobenius singularities of permanental ideals *Febuary 2025*

Algebra Seminar **IIT Madras**
Knutson ideals *Febuary 2025*

Combinatorial and Commutative Algebra Seminar **Oklahoma State University**
Barile-Macchia resolutions *October 2023*

Combinatorial and Commutative Algebra Seminar	**McMaster University**
Barile-Macchia resolutions	*October 2023*
Commutative Algebra Seminar	**Purdue University**
The F-regularity of algebraic sets related to commutator matrices	*September 2023*
Algebra and Combinatorics Seminar	**Tulane University**
Barile-Macchia resolutions	*December 2022*
Commutative Algebra Seminar	**University of Utah**
Barile-Macchia resolutions	*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 (theorems)	*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

Graduate Algebra 1	co-teach with Professor Balaji
Chennai Mathematical Institute	*Fall 2025*
MATH 3160: Applied Complex Variables	
University of Utah	*Summer 2024*

MATH 1090: Business Algebra
University of Utah   *Fall 2023*

MATH 3070: Applied Statistics I
University of Utah   *Spring 2023*

MATH 1070: Statistic Inference
University of Utah   *Fall 2022*

MATH 3150: PDEs for Engineers
University of Utah   *Spring 2022*

MATH 1210: Calculus 1
University of Utah   *Fall 2021*

MATH 2270: Linear Algebra
University of Utah   *Summer 2021*

MATH 1060: Trigonometry
University of Utah   *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 Mathemathics   *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.

Professional Memberships

- Association for Women in Mathematics
- American Mathematical Society