

# Trung Vu

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Citizenship: Vietnam

## Research interests

Algebraic combinatorics, cluster algebra, exactly solved models, integrable lattice systems, representation theory

## Technical skills

### Programming and markdown languages

Proficient in: Python, MATLAB, R, HTML, CSS,  $\text{\LaTeX}$ , Mathematica  
Familiar with: C++, Julia

### Softwares and packages

Proficient in: Sage, Macaulay2, Qiskit (for quantum computing)  
Familiar with: Tensor Flow, Arduino package from MATLAB, Pupil Labs (eye-tracking devices software)

### Languages

English (fluent), Vietnamese (fluent)

## Education

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|----------------|--|
| 2020 – Present | <b>University of Illinois at Urbana-Champaign</b> – Urbana, Illinois<br>PhD in Mathematics<br>Advisors: Professor Philippe Di Francesco and Professor Rinat Kedem  |
| 2020 – 2021    | <b>University of Illinois at Urbana-Champaign</b> – Urbana, Illinois<br>M.Sc in Mathematics<br>Advisors: Professor Philippe Di Francesco and Professor Rinat Kedem |
| 2016 – 2020    | <b>St. Olaf College</b> – Northfield, Minnesota<br>BA in Mathematics with Concentration (minor) in Neuroscience  |

## Honors and scholarships

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|-------------|---|
| 2023        | University of Illinois at Urbana-Champaign Research Board Funding Recipient                                       |
| 2022-2023   | Bourgin Departmental Fellowship - University of Illinois at Urbana-Champaign                                      |
| Summer 2022 | R. Ranga and Shantha Rao Scholarships - University of Illinois at Urbana-Champaign                                |
| 2019        | <a href="#">Steen Fellowship</a> - St. Olaf College<br><i>\$4,170 to fund independent summer research project</i> |

## Publications

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|------|---|
| 2018 | <b>Matrix Square Roots of Polynomials</b><br>Kosmas Diveris, Trung Vu<br><i>Pi Mu Epsilon Journal</i> .   |
| 2022 | <b>T-system with Slanted Initial Data</b><br>Philippe Di Francesco, Trung Vu<br><i>[in preparation]</i> . |

## Teaching

### *At University of Illinois at Urbana - Champaign*

- Spring 2022 Teaching Assistant for Calculus 2  
Fall 2021 Teaching Assistant for Calculus 1, Ranked as Excellent by Students  
Spring 2021 Teaching Assistant for Calculus 2, Ranked as Excellent by Students

### *At. St. Olaf College*

- Spring 2020 Teaching assistant for Real Analysis 1 and Combinatorics  
Fall 2019 Supplemental Instructor for Linear Algebra  
Spring 2019 Supplemental Instructor for Linear Algebra  
Spring 2018 Supplemental Instructor for Principles of Statistics  
Fall 2017 Academic Tutor for Calculus 1, Calculus 2 and Linear Algebra  
Fall 2017 Teaching Assistant for General Chemistry

## Workshops and Conferences

- March - June 2024 Long Programs: Geometry, Statistical Mechanics, and Integrability  
*Institute of Pure and Applied Mathematics, Los Angeles, CA*  
August 2023 Dimers: Combinatorics, Representation Theory and Physics  
*New York, NY*  
January 2023 Joint Mathematical Meeting  
*Boston, MA*  
April 2022 Analytic Combinatorics in Several Variables Workshop  
*American Institute of Mathematics, San Jose, CA*

## Talks and Poster Presentations

### *Talks*

- August 2023 Slanted  $T$ -system Arctic Phenomenon  
*Dimers: Combinatorics, Representation Theory and Physics, New York, NY*  
April 2023 Slanted  $T$ -system Arctic Phenomenon  
*IRT Seminar, University of Illinois at Urbana-Champaign*  
January 2023  $T$ -system and Dimers  
*Joint Mathematical Meeting, Boston, MA*  
May 2022 Introduction to Analytic Combinatorics in Several Variables with Examples  
*IRT Seminar, University of Illinois at Urbana-Champaign*  
March 2022 XXZ Model and Trigonometric  $R$ -matrix  
*IRT Seminar, University of Illinois at Urbana-Champaign*  
February 2022 Introduction to Bethe Ansatz's Equation and the Algebraic Bethe Ansatz  
*IRT Seminar, University of Illinois at Urbana-Champaign*  
February 2022 Introduction to Yang-Baxter Equation and Quantum Integrable System  
*IRT Seminar, University of Illinois at Urbana-Champaign*  
October 2021  $T$ -system with Slanted Initial Data and Pinecone  
*IRT Seminar, University of Illinois at Urbana-Champaign*

- October 2021 Arctic Curve Phenomenon of T-system via Multivariate Generating Function  
*IRT Seminar, University of Illinois at Urbana-Champaign*
- May-June 2021 T-system, Dimers and Networks (A series of 5 talks)  
*IRT Seminar, University of Illinois at Urbana-Champaign*
- February 2021 Introduction to the Pentagon Map, Part 1 - Part 3  
*IRT Seminar, University of Illinois at Urbana-Champaign*
- December 2020 Cluster Algebra and Y-patterns  
*IRT Seminar, University of Illinois at Urbana-Champaign*
- October 2019 Matrix Square Roots of Polynomial  
*Northfield Undergraduate Mathematics Symposium, St. Olaf College, Northfield, MN.*
- September 2019 Application of Algebraic Geometry and Geometric Invariant Theory on Functional Neuroimaging  
*Steen's Fellowship Event, St. Olaf College, Northfield, MN.*
- Poster Presentations**
- January 2019 Matrix Square Roots of Polynomial  
*Joint Mathematics Meeting, Undergraduate Poster Session, Baltimore, MD.*
- May 2018 Pupillometry as A Measure of Auditory Cognitive Processes and Listening Effort.  
*175th Annual Meeting of the Acoustical Society of America, Minneapolis, MN*
- May 2018 A Comparison of Free-field and Headphone Based Sound Localization Tasks.  
*175th Annual Meeting of the Acoustical Society of America, Minneapolis, MN*

## Undergraduate Research Experience

*Joint work at St. Olaf College and University of Illinois at Urbana - Champaign via Steen Fellowship*

- Summer 2019 **Application of Algebraic Geometry and Geometric Invariant Theory on Functional Neuroimaging**  
Mentor: Graduate Student Megan Finnegan  
*At. St. Olaf College*
- Summer 2018 **Geographic Variation in Temporal Pattern Recognition in The Acoustic Parasitoid Fly *Ormia ochracea***  
Mentor: Professor Norman Lee
- Fall 2017 – Spring 2020 **Free Field Sound Localization Using the Sound Localization Arc**  
Mentor: Professor Jeremy Loebach
- Fall 2017 – Spring 2019 **Pupillometry and Auditory Cognition in Normal Hearing Listeners, Hearing Impaired Individuals and Cochlear Implant Users**  
Mentor: Professor Jeremy Loebach
- Summer 2017 **Matrix Square Roots of Polynomial Project**  
Mentor: Professor Kosmas Diveris.

## Professional Memberships

- 2018 – Present Pi Mu Epsilon Mathematical Honor Society
- 2018 – Present Mathematical Association of America