

Rizeng Chen

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EDUCATION

Peking University (PKU)

School of Mathematical Sciences

Beijing, China

Sept. 2021 - Present

- Ph.D. in Mathematics

Advisor: Bican Xia

Beihang University (BUAA)

Hua Loo-keng Honorary Class, School of Mathematics Sciences

Beijing, China

Sept. 2017 - June 2021

- B.Sc in Mathematics

RESEARCH INTERESTS

- **Computational Algebraic Geometry**
- **Real Algebraic Geometry**
- **Symbolic Computation**
- **Theoretical Computer Science**

PUBLICATIONS & PREPRINTS

Published Papers.

1. “A Geometric Approach to Cylindrical Algebraic Decomposition”, *MATHEMATICS OF COMPUTATIONS* (2025),
[arXiv:2311.10515](https://arxiv.org/abs/2311.10515).
2. (with Bican Xia) “Reduction of Transcendental Decision Problems over the Reals”, *Proceedings of ISSAC '24*, pp. 56-64.
3. (with Haokun Li, Bican Xia, Tianqi Zhao, Tao Zheng) “Isolating all the real roots of a mixed trigonometric-polynomial”, *JOURNAL OF SYMBOLIC COMPUTATION* (2024), 121, 102250.
4. (with Bican Xia) “Deciding first-order formulas involving univariate mixed trigonometric-polynomials”, *Proceedings of ISSAC '23*, pp. 145-154.

Preprints.

5. “What Kind of Morphisms Induces Covering Maps over a Real Closed Field?”,
[arXiv:2502.05834](https://arxiv.org/abs/2502.05834).

TALKS

- “*A geometric approach to cylindrical algebraic decomposition*”, Regular seminar, Beihang University, Beijing, China. May 2025
- “*A geometric approach to cylindrical algebraic decomposition*”, PKU Applied Math Lunch Seminar, Peking University, Beijing, China. May 2025
- “*A geometric approach to cylindrical algebraic decomposition*”, NCSU Symbolic Computation Webinar, North Carolina State University (Virtual). April 2025
- “*Reduction of Transcendental Decision Problems over the Reals*”, ISSAC '24, North Carolina State University, Raleigh, NC, USA. July 2024
- “*The geometry of cylindrical algebraic decomposition*”, CM2024, Fujian Normal University, Fuzhou, China. June 2024
- “*Deciding first-order formulas involving univariate mixed trigonometric-polynomials*”, ISSAC '23, The Arctic University of Norway, Tromsø, Norway. July 2023

TEACHING

As Teaching Assistant in Peking University

- **Advanced Algebra II (2022 Spring, 2023 Spring, 2024 Spring, 2025 Spring)**, School of Mathematical Sciences
I graded the exercises and exam papers. I also taught the tutoring sessions.
- **Linear Algebra C (2021 Fall)**, School of Mathematical Sciences
I graded the exercises and exam papers.

SOFTWARE

- GeometricCAD (Mathematica)
- TranscendentalProblems (Mathematica)
- VerifyMTP (Mathematica)
- SCJudge (C++)
- Memorizer (Pascal)

LANGUAGE

- Mandarin: Native
- English: Fluent

MISC.

- I enjoy coding. The algorithms in my papers are all implemented and the code can be found at my GitHub page.
- I used to participate in competitive programming before going to university, but that was long ago.
- I like cats.