Rizeng Chen ♦ ⚙

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EDUCATION

Peking University (PKU)   Beijing, China

School of Mathematical Sciences   Sept. 2021 - Present

- Ph.D. in Mathematics
  Advisor: Bican Xia

Beihang University (BUAA)   Beijing, China

Hua Loo-keng Honorary Class, School of Mathematics Sciences   Sept. 2017 - June 2021

- B.Sc in Mathematics

RESEARCH INTERESTS

- **Computational Algebraic Geometry**

- **Real Algebraic Geometry**

- **Symbolic Computation**

- **Theoretical Computer Science**

PUBLICATIONS & PREPRINTS

Papers are listed in chronological order.

1. *"What Kind of Morphisms Induces Covering Maps over a Real Closed Field?"*,
   arXiv:2502.05834.

2. *"A Geometric Approach to Cylindrical Algebraic Decomposition"*, MATHEMATICS OF COMPUTATIONS (2025),
   arXiv:2311.10515.

3. (with Bican Xia) *"Reduction of Transcendental Decision Problems over the Reals"*, Proceedings of ISSAC '24, pp. 56-64.

4. (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.

5. (with Bican Xia) *"Deciding first-order formulas involving univariate mixed trigonometric-polynomials"*, Proceedings of ISSAC '23, pp. 145-154.

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.

Last Update: August 15, 2025.