Weixun Deng

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Education

Ph.D. in Mathematics
Texas A&M University, College Station, Texas *Sep. 2019 - present*
Advisor: Prof. J. Maurice Rojas

B.S. in Mathematics
Nankai University, Tianjin, China *Sep. 2015 - June 2019*

Publications

5. **Optimal Bounds for the Number of Pieces of Real Near-Circuit Hypersurfaces**
by Weixun Deng, J. Maurice Rojas, and Cordelia Russell, in Proceedings of ISSAC 2025 (International Symposium on Symbolic and Algebraic Computation), pp. 319-327, *2025*

4. **Viro's Patchworking and the signed reduced A-discriminant**
by Weixun Deng, J. Maurice Rojas, and Mate Telek, Journal of Symbolic Computation, Volume 132, 28 pages, *2025*

3. **Feasibility of Circuit Polynomials without Purple Swans**
by Weixun Deng, Alperen Ergur, Grigoris Paouris, and J. Maurice Rojas, in Proceedings of ISSAC 2024 (International Symposium on Symbolic and Algebraic Computation), pp. 429-436, *2024*

2. **Quickly Computing Isotopy Type for Exponential Sums over Circuits (Extended Abstract)**
by Frederic Bihan, Erika Croy, Weixun Deng, Kaitlyn Phillipson, Robert J. Rennie, and J. Maurice Rojas, ACM Communications in Computer Algebra, Volume 57, Issue 3, pp. 152-155, *2023*

Preprints:

1. **Trinomials and Deterministic Complexity Limits for Real Solving**
by Erick Boniface, Weixun Deng, and J. Maurice Rojas, arXiv: 2202.06115, in revision

Research Interest

- Real Algebraic Geometry
- Algorithmic Algebraic Geometry
- Fewnomial Theory
- Tropical Geometry
- Complexity Theory

Awards and Honors

- **Thomas Powell '62 Fellowship** *Aug. 2024*
Texas A&M University
- **Travel Award for the 2025 SIAM Conference on Applied Algebraic Geometry** *July 2025*
- **Travel Award for the 2023 SIAM TX-LA Conference** *Nov. 2023*

Conference Presentation

Talks:

- **Computing Isotopy Types of Positive Zero Sets of Near-Circuit Polynomials**
  2025 SIAM Conference on Applied Algebraic Geometry, Madison, WI *July 2025*
- **Computing Isotopy Type of Positive Zero Sets Faster for Near-Circuit Polynomials**
  7th SIAM Texas-Louisiana Sectional Meeting, Waco, TX *Oct. 2024*
- **Computing Isotopy Type of Positive Zero Sets Faster for n-variate $(n+k)$-nomials**
  6th SIAM Texas-Louisiana Sectional Meeting, Lafayette, LA *Nov. 2023*
- **Fewnomials Optimization and the Number of Connected Components**
  2022 INFORMS Annual Meeting, Indianapolis, IN *Oct. 2022*
- **Randomization in Solving and Diophantine Approximation**
  4th Annual Meeting of the SIAM Texas-Louisiana Section, South Padre Island, TX *Nov. 2021*

Posters:

- **Quickly Computing Isotopy Type for Exponential Sums over Circuits**
  The International Symposium on Symbolic and Algebraic Computation (ISSAC) 2023, Tromsø, Norway *July 2023*

Skills

- **Programming Languages:** Python, C++.
- **Software:** LaTeX, Matlab, Mathematica, Maple.
- **Languages:** English, Chinese, Cantonese.

REU (Research Experiences for Undergraduates) Mentoring

- Mentor for 2 REU students. Result in the following paper (listed earlier): *Optimal Bounds for the Number of Pieces of Real Near-Circuit Hypersurfaces.* *Texas A&M University, Summer 2024*
- Mentor for 3 REU students. *Texas A&M University, Summer 2023*
- Mentor for 1 REU student. Result in the following paper (listed earlier): *Trinomials and Deterministic Complexity Limits for Real Solving.* *Texas A&M University, Summer 2021*

Teaching Experience at Texas A&M University

Instructor of Record

- Math 142 - Business Calculus *Fall 2024*
- Math 142 - Business Calculus *Fall 2023*

Teaching Assistant

- Recitation Leader for Math 151 - Engineering Mathematics I *Fall 2025*
- Recitation Leader for Math 152 - Engineering Mathematics II *Spring 2024*
- Recitation Leader for Math 151 - Engineering Mathematics I *Spring 2023*
- Recitation Leader for Math 152 - Engineering Mathematics II *Spring 2022*
- Recitation Leader for Math 152 - Engineering Mathematics II *Spring 2021*
- Recitation Leader for Math 151 - Engineering Mathematics I *Fall 2020*