CURRICULUM VITAE

Personal Data

Name: Jie Wang
M/F: M
Date of Birth: 23/05/1990
Nationality: China
Phone: (+33) 07 85 13 26 14
E-mail: jwang@laas.fr
Homepage: https://wangjie212.github.io/jiewang/

Work Experience

- 7/2021–present, Associate research fellow, Chinese Academy of Sciences
- 7/2019–6/2021, Postdoctoral researcher, Centre National de la Recherche Scientifique, Mentor: Victor Magron and Jean-Bernard Lasserre
- 7/2017–6/2019, Postdoc, Peking University, Mentor: Bican Xia

Education

- Doctor of Mathematics (9/2012-7/2017)

- Academy of Mathematics and Systems Science, Chinese Academy of Sciences
- Supervisor: Xiao-Shan Gao

- Bachelor of Mathematics (9/2008-7/2012)

University of Science and Technology of China

Research Interests

Large-scale polynomial optimization, semidefinite programming, real algebraic geometry, symbolic computation and their applications

Publications

Preprints in submission

1. **Jie Wang** and Victor Magron, Exploiting Sparsity in Complex Polynomial Optimization, arXiv:2103.12444, 2021.
2. Nils Vreman, Paolo Pazzaglia, **Jie Wang**, Victor Magron and Martina Maggio, Stability of Control Systems under Extended Weakly-Hard Constraints, arXiv:2101.11312, 2021.
3. Jared Miller, **Jie Wang**, Mario Sznaier and Octavia Camps, Model Fitting by Semialgebraic Clustering, 2020.
4. **Jie Wang**, Nonnegative Polynomials and Circuit Polynomials, arXiv:1804.09455, 2020.
5. **Jie Wang**, Victor Magron, Jean-Bernard Lasserre and Ngoc Hoang Anh Mai, CS-TSSOS: Correlative and Term Sparsity for Large-Scale Polynomial Optimization, arXiv:2005.02828, 2020.
6. Ngoc Hoang Anh Mai, Jean-Bernard Lasserre, Victor Magron and **Jie Wang**, Exploiting constant trace property in large-scale polynomial optimization, arXiv:2012.08873, 2020.

Published and accepted

7. Victor Magron and **Jie Wang**, SONC Optimization and Exact Nonnegativity Certificates via Second-Order Cone Programming, Accepted by *Journal of Symbolic Computation*, 2021.

8. **Jie Wang** and Victor Magron, Exploiting Term Sparsity in Noncommutative Polynomial Optimization, Accepted by *Computational Optimization and Applications*, 2021

9. Jeffrey Uhlmann and **Jie Wang**, On Radically Expanding the Landscape of Potential Applications for Automated Proof Methods, *SN Computer Science*, 2(4):1-9, 2021.

10. Victor Magron and **Jie Wang**, TSSOS: a Julia library to exploit sparsity for large-scale polynomial optimization, Accepted by MEGA'21, 2021.

11. **Jie Wang**, Martina Maggio and Victor Magron, SparseJSR: A Fast Algorithm to Compute Joint Spectral Radius via Sparse SOS Decompositions, to be published in Proc. of ACC'21, 2021.

12. **Jie Wang**, Victor Magron and Jean-Bernard Lasserre, Chordal-TSSOS: a Moment-SOS Hierarchy that Exploits Term Sparsity with Chordal Extension, *SIAM Journal of Optimization*, 31(1):114-141, 2021.

13. **Jie Wang**, Victor Magron and Jean-Bernard Lasserre, TSSOS: A Moment-SOS Hierarchy that Exploits Term Sparsity, *SIAM Journal of Optimization*, 31(1):30-58, 2021.

14. **Jie Wang** and Victor Magron, A Second Order Cone Characterization for Sums of Nonnegative Circuits, in *Proceedings of* the *45th International Symposium on Symbolic and Algebraic Computation*, ACM, 450-457, 2020.

15. Xiaoxian Tang and **Jie Wang**, Bistability of Sequestration Networks, *Discrete & Continuous Dynamical Systems - B*, 26(3):1337-1357, 2021.

16. **Jie Wang**, Systems of Polynomials with at Least One Positive Real Zero, *Journal of Algebra and Its Applications*, 19(10), 2020.

17. **Jie Wang**, Toric P-Difference Varieties, *Science China Mathematics*, 63(4):643-670, 2020.

18. **Jie Wang**, Haokun Li and Bican Xia, A New Sparse SOS Decomposition Algorithm Based on Term Sparsity, in *Proceedings of the 44th International Symposium on Symbolic and Algebraic Computation*, ACM, 347-354, 2019.

19. **Jie Wang**, Finite Basis for Radical Well-Mixed Difference Ideals Generated by Binomials, *Communications in Algebra*, 46(6):2589-2599, 2018.

20. **Jie Wang**, Difference Indices of Quasi-Prime Difference Algebraic Systems, *Journal of Symbolic Computation*, 87:1-13, 2018.

21. **Jie Wang**, Difference Indices of Quasi-Regular Difference Algebraic Systems, *Journal of Mathematical Sciences: Advances and Applications*, 46:31-49, 2017.

22. **Jie Wang**, Monomial Difference Ideals, *Proceedings of the American Mathematical Society*, 145(4):1481-1496, 2017.

23. XiaoShan Gao, Zhang Huang, **Jie Wang** and ChunMing Yuan, Toric Difference Variety, *Journal of Systems Science & Complexity*, 30(1):173-195, 2017.

Invited Talks (excluding conference presentations)

1. "The Finitely Generated Property of Binomial Difference Ideals", The 2nd Workshop on Combinatorial Mathematics and Symbolic Computation, Tianjin, 6/2017

2. “On Systems of Polynomials with at Least One Positive Zero”, Youth Forum of National Center for Mathematics and Interdisciplinary Sciences, CAS, Beijing, 10/2018
3. “Nonnegative Polynomials and Circuit Polynomials”, SIAM Conference on Applied Algebraic Geometry, Switzerland, 7/2019
4. “Exploiting Term Sparsity in SOS programming and Sparse Polynomial Optimization”, International Conference on Continuous Optimization, Berlin, 8/2019
5. “Exploiting Sparsity in Noncommutative Polynomial Optimization”, European Congress of Mathematics, 6/2021
6. “Exploiting Sparsity in Large-Scale Polynomial Optimization”, SIAM Conference on Optimization, 7/2021
7. “A Second Order Cone Representation of SONC cones”, SIAM Conference on Applied Algebraic Geometry, 8/2021

Honor & Awards

2016, Gained the “Dean Special Prize” of Academy of Mathematics and Systems Science, CAS

2017, Gained the title of “Outstanding Graduates” of University of Chinese Academy of Sciences

2019, SIAM Conference on Applied Algebraic Geometry travel grant for early career researcher

Project Funding

The 64th China Postdoctoral Science Foundation

Teaching Experience

Autumn 2017, Basic Geometry, Peking University

Open-source Software

1. TSSOS

TSSOS is a Julia package for sparse polynomial optimization.

https://github.com/wangjie212/TSSOS

2. SONCSOCP

SONCSOCP is a Julia package for uncontrained sparse polynomial optimization based on the second-order cone representation of SONC cones.

https://github.com/wangjie212/SONCSOCP

3. SparseJSR

SparseJSR is a Julia package for computing joint spetral radii of matrices based on sparse SOS decompositions.

https://github.com/wangjie212/SparseJSR

4. ChordalGraph

ChordalGraph is an extension of the Julia package LightGraphs to handle chordal graphs.

https://github.com/wangjie212/ChordalGraph

5. NCTSSOS

NCTSSOS is a Julia package for sparse noncommutative polynomial optimization.

https://github.com/wangjie212/NCTSSOS

Professional Services

Reviewer for Journals

SIAM Journal on Applied Algebra and Geometry, Mathematical Programming, Mathematics of Operations Research, Journal of Symbolic Computation, Journal of System Science and Complexity

Reviewer for Conferences

International Symposium on Symbolic and Algebraic Computation (2018, 2019, 2020), Conference on Effective Methods in Algebraic Geometry (2021)

Reviewer for Databases

zbMATH, MathSciNet