

Jose Israel Rodriguez (Publication List)

Publications listed on MathSciNet

1. J. LINDBERG, C. AMÉNDOLA, AND J. I. RODRIGUEZ, *Estimating Gaussian mixtures using sparse polynomial moment systems*, SIAM J. Math. Data Sci., 7 (2025), pp. 224–252. DOI
2. L. T. G. MAXIM, J. I. RODRIGUEZ, AND B. WANG, *Applications of singularity theory in applied algebraic geometry and algebraic statistics*, in Handbook of geometry and topology of singularities VII, Springer, Cham, [2025] ©2025, pp. 767–818. DOI
3. Y. ALEXANDR, M. BAKENHUS, M. CURIEL, S. K. DESHPANDE, E. GROSS, Y. GU, M. HILL, J. JOHNSON, B. KAGY, V. KARWA, J. LI, H. LYU, S. PETROVIĆ, AND J. I. RODRIGUEZ, *New directions in algebraic statistics: three challenges from 2023*, Algebr. Stat., 15 (2024), pp. 357–382. DOI
4. M. HILL, S. ROCH, AND J. I. RODRIGUEZ, *Maximum Likelihood Estimation for Unrooted 3-Leaf Trees: An Analytic Solution for the CFN Model*, Bull. Math. Biol., 86 (2024), p. Paper No. 106. DOI
5. K. LEE, J. LINDBERG, AND J. I. RODRIGUEZ, *Implementing real polyhedral homotopy*, J. Softw. Algebra Geom., 14 (2024), pp. 59–71. DOI
6. L. G. MAXIM, J. I. RODRIGUEZ, B. WANG, AND L. WU, *Linear optimization on varieties and Chern-Mather classes*, Adv. Math., 437 (2024), pp. Paper No. 109443, 22. DOI
7. L. T. G. MAXIM, J. I. RODRIGUEZ, B. WANG, AND L. WU, *Logarithmic cotangent bundles, Chern-Mather classes, and the Huh-Sturmfels involution conjecture*, Comm. Pure Appl. Math., 77 (2024), pp. 1486–1508. DOI
8. T. DUFF, A. LEYKIN, AND J. I. RODRIGUEZ, *u-generation: solving systems of polynomials equation-by-equation*, Numer. Algorithms, 95 (2024), pp. 813–838. DOI
9. J. LINDBERG AND J. I. RODRIGUEZ, *Invariants of SDP exactness in quadratic programming*, J. Symbolic Comput., 122 (2024), pp. Paper No. 102258, 18. DOI
10. L. G. MAXIM, J. I. RODRIGUEZ, AND B. WANG, *Euclidean distance degree of projective varieties*, Int. Math. Res. Not. IMRN, (2021), pp. 15788–15802. DOI
11. J. LINDBERG, N. NICHOLSON, J. I. RODRIGUEZ, AND Z. WANG, *The maximum likelihood degree of sparse polynomial systems*, SIAM J. Appl. Algebra Geom., 7 (2023), pp. 159–171. DOI

12. P. MILENKOVIC, Z. WANG, AND J. I. RODRIGUEZ, *Encountering singularities of a serial robot along continuous paths at high precision*, Mechanism and Machine Theory, 181 (2023), p. 105224. DOI
13. E. HOROBET AND J. I. RODRIGUEZ, *Data loci in algebraic optimization*, J. Pure Appl. Algebra, 226 (2022), pp. Paper No. 107144, 15. DOI
14. L. G. MAXIM, J. I. RODRIGUEZ, AND B. WANG, *A Morse theoretic approach to non-isolated singularities and applications to optimization*, J. Pure Appl. Algebra, 226 (2022), p. Paper No. 106865. DOI
15. J. I. RODRIGUEZ, J.-H. DU, Y. YOU, AND L.-H. LIM, *Fiber product homotopy method for multiparameter eigenvalue problems*, Numer. Math., 148 (2021), pp. 853–888. DOI
16. T. BRYŚIEWICZ, J. I. RODRIGUEZ, F. SOTTILE, AND T. YAHL, *Solving decomposable sparse systems*, Numer. Algorithms, 88 (2021), pp. 453–474. DOI
17. T. BRYŚIEWICZ, J. I. RODRIGUEZ, F. SOTTILE, AND T. YAHL, *Decomposable sparse polynomial systems*, J. Softw. Algebra Geom., 11 (2021), pp. 53–59. DOI
18. J. D. HAUENSTEIN, A. LEYKIN, J. I. RODRIGUEZ, AND F. SOTTILE, *A numerical toolkit for multiprojective varieties*, Math. Comp., 90 (2021), pp. 413–440. DOI
19. J. I. RODRIGUEZ AND B. WANG, *Computing Euler Obstruction Functions Using Maximum Likelihood Degrees*, Int. Math. Res. Not. IMRN, (2020), pp. 6699–6712. DOI
20. L. G. MAXIM, J. I. RODRIGUEZ, AND B. WANG, *Defect of Euclidean distance degree*, Adv. in Appl. Math., 121 (2020), pp. 102101, 22. DOI
21. J. D. HAUENSTEIN AND J. I. RODRIGUEZ, *Multiprojective witness sets and a trace test*, Adv. Geom., 20 (2020), pp. 297–318. DOI
22. D. I. BERNSTEIN, C. FARNSWORTH, AND J. I. RODRIGUEZ, *The algebraic matroid of the finite unit norm tight frame (funtf) variety*, J. Pure Appl. Algebra, 224 (2020), pp. 106351, 15. DOI
23. L. G. MAXIM, J. I. RODRIGUEZ, AND B. WANG, *Euclidean distance degree of the multiview variety*, SIAM J. Appl. Algebra Geom., 4 (2020), pp. 28–48. DOI
24. C. AMÉNDOLA, N. BLISS, I. BURKE, C. R. GIBBONS, M. HELMER, S. HOŞTEN, E. D. NASH, J. I. RODRIGUEZ, AND D. SMOLKIN, *The maximum likelihood degree of toric varieties*, J. Symbolic Comput., 92 (2019), pp. 222–242. DOI

25. J. I. RODRIGUEZ, *Solving the likelihood equations to compute Euler obstruction functions*, in Mathematical software—ICMS 2018, vol. 10931 of Lecture Notes in Comput. Sci., Springer, Cham, 2018, pp. 405–413. DOI
26. J. D. HAUENSTEIN, J. I. RODRIGUEZ, AND F. SOTTILE, *Numerical computation of Galois groups*, Found. Comput. Math., 18 (2018), pp. 867–890. DOI
27. A. LEYKIN, J. I. RODRIGUEZ, AND F. SOTTILE, *Trace test*, Arnold Math. J., 4 (2018), pp. 113–125. DOI
28. J. I. RODRIGUEZ AND B. WANG, *The maximum likelihood degree of mixtures of independence models*, SIAM J. Appl. Algebra Geom., 1 (2017), pp. 484–506. DOI
29. J. I. RODRIGUEZ AND X. TANG, *A probabilistic algorithm for computing data-discriminants of likelihood equations*, J. Symbolic Comput., 83 (2017), pp. 342–364. DOI
30. A. MARTÍN DEL CAMPO AND J. I. RODRIGUEZ, *Critical points via monodromy and local methods*, J. Symbolic Comput., 79 (2017), pp. 559–574. DOI
31. E. HOROBEȚ AND J. I. RODRIGUEZ, *The maximum likelihood data singular locus*, J. Symbolic Comput., 79 (2017), pp. 99–107. DOI
32. J. I. RODRIGUEZ AND X. TANG, *Data-discriminants of likelihood equations*, in ISSAC’15—Proceedings of the 2015 ACM International Symposium on Symbolic and Algebraic Computation, ACM, New York, 2015, pp. 307–314. DOI
33. J. I. RODRIGUEZ, *Combinatorial excess intersection*, J. Symbolic Comput., 68 (2015), pp. 297–307. DOI
34. J. I. RODRIGUEZ, *Maximum likelihood for dual varieties*, in SNC 2014—Proceedings of the 2014 Symposium on Symbolic-Numeric Computation, ACM, New York, 2014, pp. 43–49. DOI
35. J. I. RODRIGUEZ, III, *Numerical algebraic geometry for maximum likelihood estimation*, ProQuest LLC, Ann Arbor, MI, 2014. Thesis (Ph.D.)—University of California, Berkeley, URL
36. J. HAUENSTEIN, J. I. RODRIGUEZ, AND B. STURMFELS, *Maximum likelihood for matrices with rank constraints*, J. Algebr. Stat., 5 (2014), pp. 18–38. DOI
37. J. DRAISMA AND J. RODRIGUEZ, *Maximum likelihood duality for determinantal varieties*, Int. Math. Res. Not. IMRN, (2014), pp. 5648–5666. DOI

38. E. GROSS AND J. I. RODRIGUEZ, *Maximum likelihood geometry in the presence of data zeros*, in ISSAC 2014—Proceedings of the 39th International Symposium on Symbolic and Algebraic Computation, ACM, New York, 2014, pp. 232–239. DOI
39. J. RODRIGUEZ, *Bounding the degree of Belyi polynomials*, J. Number Theory, 133 (2013), pp. 2892–2900. DOI
40. J. RODRIGUEZ AND M. RUGGIU, *A novel method for the solution of the forward displacement problem of spherical parallel manipulators*, ZAMM Z. Angew. Math. Mech., 93 (2013), pp. 73–82. DOI

Accepted Publications and those not on MathSciNet

41. B. FINKEL, J. I. RODRIGUEZ, C. WU, AND T. YAHL, *Activation degree thresholds and expressiveness of polynomial neural networks*, 2025. arXiv: 2408.04569
42. O. HENRIKSSON, C. AMENDOLA, J. I. RODRIGUEZ, AND P. Y. YU, *Maximum likelihood estimation of log-affine models using detailed-balanced reaction networks*, Journal of Mathematical Biology (To appear), (2024). arXiv: 2411.07986
43. H. C. KOTTLER, J. LINDBERG, AND J. I. RODRIGUEZ, *Method of moments for Gaussian mixtures: Implementation and benchmarks*, 2025. arXiv: 2502.07648
44. C. AMENDOLA AND J. I. RODRIGUEZ, *A primer in likelihood geometry*, (To appear). URL
45. C. AMENDOLA, J. LINDBERG, AND J. I. RODRIGUEZ, *Solving systems of polynomial equations with decomposable projections*, Proceedings of Varieties, Polyhedra, Computation, (To appear)

Published Short Communications

46. M. HILL AND J. I. RODRIGUEZ, *A maximum likelihood estimator for quartets under the Cavender-Farris-Neyman model*, ACM Commun. Comput. Algebra, 58 (2024), pp. 35–38. DOI
47. A. K. ENGLANDER AND J. I. RODRIGUEZ, *Towards learning the positive real discriminant of the Wnt signaling pathway shuttle model*, ACM Commun. Comput. Algebra, 58 (2024), pp. 85–88. DOI
48. J. I. RODRIGUEZ, *Maximum likelihood degrees, Euclidean distance degrees, and the topology underneath*. Oberwolfach Rep. 19, No. 4, 3121–3170 (2022)., 2022. DOI

49. L.-H. LIM, J. I. RODRIGUEZ, AND Y. YOU., *Numerical homotopy methods for multiparameter eigenvalue problems*, XXI Householder Symposium on Numerical Linear Algebra, (2020), pp. 344–346
50. X. LI, J. I. RODRIGUEZ, AND B. WANG, *A numerical approach for computing euler characteristics of affine varieties*, in Mathematical Software – ICMS 2020, A. M. Bigatti, J. Carette, J. H. Davenport, M. Joswig, and T. de Wolff, eds., Cham, 2020, Springer International Publishing, pp. 51–60. URL
51. C. CROWLEY, J. I. RODRIGUEZ, J. WEIKER, AND J. ZOROMSKI, *Multi-Regeneration for polynomial system solving*, ACM Commun. Comput. Algebra, 54 (2020), pp. 39–43. DOI ****Awarded Distinguished Software Presentation at ISSAC*
52. M. HÄRKÖNEN, B. HOLLERING, F. T. KASHANI, AND J. I. RODRIGUEZ, *Algebraic optimization degree*, ACM Commun. Comput. Algebra, 54 (2020), pp. 44–48. DOI
53. C. FARNSWORTH AND J. I. RODRIGUEZ, *Homogenized funtf varieties and algebraic frame completion*, ACM Commun. Comput. Algebra, 52 (2018), pp. 108–111. DOI
54. J. I. RODRIGUEZ, *Testing membership of the likelihood correspondence*. Oberwolfach Rep. 14, No. 2, 1207-1279 (2017)., 2017. DOI

Preprints

55. P. MILENKOVIC, J. I. RODRIGUEZ, AND Z. WANG, *Encircling singularities of a serial robot to find alternative inverse-kinematic solutions*, Doi:10.2139/ssrn.4946800, (2024). DOI
56. D. J. BATES, E. GROSS, A. LEYKIN, AND J. I. RODRIGUEZ, *Bertini for Macaulay2*, 2013. arXiv: 1310.3297
57. Y. YOU, J. I. RODRIGUEZ, AND L.-H. LIM, *Accurate solutions of polynomial eigenvalue problems*, 2017. arXiv: 1711.01301
58. J. I. RODRIGUEZ AND B. WANG, *Numerical computation of braid groups*, 2017. arXiv: 1711.07947