Dr. Bo Huang
School of Mathematical Sciences
Beihang University, China
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Born on 20/05/1991

RESEARCH INTERESTS

- Symbolic and Algebraic Computation
- Differential Equations and Dynamical Systems

EDUCATION

- 09/2016–01/2021. **Ph.D.** in Applied Mathematics, School of Mathematical Sciences, Beihang University, with Dongming Wang
- 09/2018–09/2020. Joint **Ph.D.** in Computer Science, Courant Institute of Mathematical Sciences, New York University, with Chee Yap
- 09/2014–07/2016. **M.S.** in Applied Mathematics, School of Mathematical Sciences, Beihang University, with Linping Peng
- 09/2010–07/2014. **B.S.** in Mathematics and Applied Mathematics, School of Mathematics and Statistics, Xuchang University

EMPLOYMENT

- 01/2021–: School of Mathematical Sciences, Beihang University
  Postdoctoral, with Deren Han

PUBLICATIONS

1. C. Chen, **B. Huang**, D. Yu, D. Han. Optimal parameter of the SOR-like iteration method for solving absolute value equations. Under Review
2. X. Li, K. Chen, W. Niu, **B. Huang***. Stability and chaos of the duopoly model of Kopel: A study based on symbolic computations. arXiv: 2304.02136

3. **B. Huang**, D. Wang. Zero-Hopf bifurcation of limit cycles in certain differential systems. arXiv: 2205.14450

4. **B. Huang**, X. Li, W. Niu, S. Xie. Stability and zero-Hopf bifurcation analysis of the Lorenz–Stenflo system using symbolic methods. *Proceedings of the 2023 International Workshop on Computer Algebra in Scientific Computing*, to appear

5. **B. Huang**, L. Peng. Third-order bifurcation of limit cycles for a perturbed quartic isochronous center. *Int. J. of Dynamical Systems and Differential Equations*, to appear

6. **B. Huang**. Using symbolic computation to analyze zero-Hopf bifurcations of polynomial differential systems. *Proceedings of the 2023 International Symposium on Symbolic and Algebraic Computation*, pp. 307–314, 2023

7. **B. Huang**, C. Yap. An algorithmic approach to small limit cycles of nonlinear differential systems: The averaging method revisited. *Journal of Symbolic Computation*, **115**, 492–517, 2023, an essential improvement for the paper in *Proceedings of the 44th International Symposium on Symbolic and Algebraic Computation*, pp. 211–218, 2019

8. **B. Huang**, W. Niu, D. Wang. Symbolic computation for the qualitative theory of differential equations. *Acta Mathematica Scientia*, **42B**, 2478–2504, 2022

9. **B. Huang**, L. Peng, Y. Cui. On the number of limit cycles bifurcating from a quartic reversible center. *Mediterranean Journal of Mathematics*, **19**, 220, 2022

10. Y. Tian, **B. Huang***. Local stability and Hopf bifurcations analysis of the Muthuswamy-Chua-Ginoux system. *Nonlinear Dynamics*, **109**, 1135–1151, 2022

11. **B. Huang**, W. Niu, S. Xie. Algebraic analysis of zero-Hopf bifurcation in a Chua system. *Symmetry*, **14**, 1036-1–16, 2022

12. **B. Huang**, D. Han. Analysis of zero-Hopf bifurcation in high dimensional polynomial differential systems with algorithm derivation (in Chinese). *Journal of Systems Science and Mathematical Sciences*, **41**, 3280–3298, 2021

13. Y. Hu, W. Niu, **B. Huang***. Bounding the number of limit cycles for parametric Liénard systems using symbolic computation methods. *Communications in Nonlinear Science and Numerical Simulation*, **96**, 105716, 2021

14. **B. Huang**. Algorithmic averaging for studying periodic orbits of planar differential systems. *Proceedings of the 45th International Symposium on Symbolic and Algebraic Computation*, pp. 241–248, 2020

15. **B. Huang**. On the limit cycles for a class of discontinuous piecewise cubic polynomial differential systems. *Electronic Journal of Qualitative Theory of Differential Equations*, **25**, 1–24, 2020

16. B. Sang, **B. Huang**. Zero-Hopf bifurcations of 3D jerk quadratic system. *Mathematics*, **8**, 1454-1–19, 2020

17. D. Wang, **B. Huang**, X. Chen. On n-sectors of the angles of an arbitrary triangle. *Mathematics in Computer Science*, **14**, 757–773, 2020

18. **B. Huang**. Limit cycles for a discontinuous quintic polynomial differential system. *Qualitative Theory of Dynamical Systems*, **18**, 769–792, 2019

19. **B. Huang**, W. Niu. Analysis of snapback repellers using methods of symbolic computation. *International Journal of Bifurcation and Chaos*, **29**, 1950054-1–13, 2019

20. **B. Huang**, W. Niu. Algebraic analysis of bifurcations and chaos for discrete dynamical systems. *Proceedings of the 8th Mathematical Aspects of Computer and Information Sciences*, pp. 169–184, 2019

21. **B. Huang**, W. Niu. Limit cycles for two classes of planar polynomial differential systems with uniform isochronous centers. *Journal of Applied Analysis and Computation*, **9**, 943–961, 2019

22. **B. Huang**, W. Niu. Algebraic approach to chaos induced by snapback repeller. *ACM Communications in Computer Algebra*, **53**, 122–125, 2019

23. **B. Huang**, J.Y.Hong, G.Q.Jing, W. Niu, and L. Fang. Traveling wave solutions of the homogeneous one-dimensional FREFLO model. *AIP Advances*, **8**, 015217-1–8, 2018

24. **B. Huang**, S. Xie. Searching for traveling wave solutions of nonlinear evolution equations in mathematical physics. *Advances in Difference Equations*, **29**, 1–15, 2018

25. **B. Huang**. Bifurcation of limit cycles from the center of a quintic system via the averaging method. *International Journal of Bifurcation and Chaos*, **27**, 1750072-1–16, 2017

26. B. Sang, **B. Huang**. Bautin bifurcation of a financial system. *Electronic Journal of Qualitative Theory of Differential Equations*, **95**, 1–22, 2017

27. L. Peng, **B. Huang**. Second-order bifurcation of limit cycles from a quadratic reversible center. *Electronic Journal of Differential Equations*, **89**, 1–17, 2017

GRANTS AWARDED

- Limit Cycle Bifurcation and Chaotic Behavior for Dynamical Systems Using Methods of Symbolic Computation
  Principal Investigator, Fund for Young Scientists, NSFC, 01/2022–12/2024
  300,000 CNY

- Study on Nonconvex Optimization Problems Arising from Machine Learning and Artificial Intelligence
  Participant, Fund for Key Program, NSFC, 01/2022–12/2026 2520,000 CNY

- Mathematical Innovation Method and Software Module Development in Digital Circuit Physical Design Automation
  Participant, Fund for R & D Program, MST, 05/2022–04/2025 31500,000 CNY

- Academic Excellent Foundation of BUAA for PhD Students
  Principal Investigator, 06/2019–06/2020 40,000 CNY

- Qualitative Analysis of Nonlinear Systems – Applications of Symbolic Computation for Stability, Bifurcation and Limit Cycles
  Principal Investigator, Open Fund of Guangxi Key Laboratory of Hybrid Computation and IC Design Analysis (HCIC 201602), 12/2016–12/2018 20,000 CNY

RECENT TALKS

1. On the Number of Limit Cycles from Zero-Hopf Bifurcation for Certain Differential Systems. *Dynamical Systems Seminar at Institute of Mathematics (CAS)*, Beijing, China, May, 2022 (*online*)

2. Analysis of Zero-Hopf Bifurcation in High Dimensional Polynomial Differential Systems with Algorithm Derivation. *Computer Mathematics 2021*, Guilin, China, June, 2021

3. Algorithmic Averaging for Studying Periodic Orbits of Planar Differential Systems. *45th International Symposium on Symbolic and Algebraic Computation* (ISSAC 2020), Kalamata, Greece, 20–23 July, 2020 (*online*)

4. An Algorithmic Approach to Limit Cycles of Nonlinear Differential Systems: The Averaging Method Revisited. *44th International Symposium on Symbolic and Algebraic Computation* (ISSAC 2019), Beijing, China, 15–18 July, 2019

5. On n-sectors of the Angles of an Arbitrary Triangle. *12th International Conference on Automated Deduction in Geometry* (ADG 2018), Nanning, China, 11–14 September, 2018

ACADEMIC POPULARIZATION

- The Mysterious Limit Cycles (in Chinese)
  http://blog.sciencenet.cn/blog-1362128-1088470.html

- The Fingerprints of God – Fractal and Chaos (in Chinese)
  http://blog.sciencenet.cn/blog-1362128-1104527.html

AWARDS

- 2022 Excellent Doctoral Dissertation of Beihang University
- 2021 Outstanding Graduate of Beijing Higher Education
- 2021 Postdoctoral Fellow of "Zhuoyue" Program
- 2020 Top 10 Ph.D. Students Award Nomination of Beihang University
- 2019 National Scholarship for Ph.D. Students
- 2018 Supported by China Scholarship Council, No. 201806020128
- 2015 First Prize of National Graduate Mathematical Contest in Modeling
- 2012 Second Prize of National Undergraduate Mathematical Contest in Modeling

ACADEMIC ACTIVITIES

- **Committee Member** of Chinese Society of Computer Mathematics (2021–
- JOURNAL REFEREE

  European Journal of Applied Mathematics Bulletin des Sciences Mathématiques
  Journal of Symbolic Computation Journal of Systems Science and Complexity
  International Journal of Non-Linear Mechanics Differential Equations and Dynamical Systems
  Communications in Nonlinear Science and Numerical Simulation
  Qualitative Theory of Dynamical Systems

COMPUTER SKILLS

- Maple, Matlab, Latex, Adobe Photoshop

REFERENCES

Dongming Wang (Member of Academia Europaea)
Professor at Beihang University, China / Research Director at CNRS, France
School of Mathematical Sciences
Beihang University
Beijing 100191, China
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Chee Yap (Member of Academia Europaea, Foreign)
Professor at New York University, USA
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