Curriculum Vitae

Personal Data

Full name	Yi Zhang
Date of birth	12.12.1988
Place of birth	Changzhou, Jiangsu Province, China
Nationality	Chinese
Marital Status	Single

Contact

E-mail	Yi.Zhang@UTDallas.edu
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Research Interests

Symbolic Computation, Computer Algebra, Computational Algebraic Geometry, Algorithmic Combinatorics, Algebraic Theory of Differential and Difference Equations

Education

09/2013 – 02/2017	Ph.D. in Mathematics with distinction, Institute for Algebra, Johannes Kepler University Linz, Austria. (Co-supervisors: Prof. Manuel Kauers and Prof. Ziming Li)
09/2011 – 07/2016	Ph.D. in Applied Mathematics, Key Laboratory of Mathematics Mechanization, Academy of Mathematics and Systems Science, University of Academy of Sciences, Beijing, China. (Co-supervisors: Prof. Manuel Kauers and Prof. Ziming Li)
09/2007 – 07/2011	B.Sc. in Mathematics, School of Mathematical Sciences, Soochow University, Suzhou, China.

Work Experience

09/2018 – present Research Associate, Department of Mathematical Sciences, The University of Texas at Dallas, USA. (Advisor: Prof. Carlos E. Arreche)

03/2017 – 08/2018 Postdoctoral researcher, Johann Radon Institute for Computational and Applied Mathematics (RICAM), Austrian Academy of Sciences, Austria. (Advisor: Prof. Christoph Koutschan)

Visiting Experience

05/2017 Visiting scholar, Department of Mathematics , Kobe University, Japan. (Host researcher: Prof. Nobuki Takayama)

Career-Related Activities

- reviewer for Mathematical Reviews

Teaching Experience

Spring 2019 Instructor. (Linear Algebra)
The University of Texas at Dallas.

Awards

07/2016 ISSAC'16 Distinguished Student Author Award, SIGSAM, Association for Computing Machinery.

09/2009 – 07/2010 The Second Prize Scholarship of Soochow University, Suzhou, China.

09/2008 – 07/2009 The First Prize Scholarship of Soochow University, Suzhou, China.

09/2007 – 07/2008 The First Prize Scholarship of Soochow University, Suzhou, China.

09/2007 – 07/2008 The Zhu Jingwen Scholarship of Soochow University, Suzhou, China.

09/2007 – 07/2008 The Merit Student of Soochow Universtiy, Suzhou, China.

PhD Thesis

- Yi Zhang. *Univarite Contraction and Multivariate Desingularization of Ore Ideals*. PhD thesis, Institute for Algebra, Johannes Kepler University Linz, 2017. arXiv:1710.07445

Publications

1. Jordan Tirrell, Bruce W. Westbury and Yi Zhang. *Set partitions and G_2 webs*, 2019, in preparation.

2. Thieu N. Vo and Yi Zhang. *Rational Solutions of High-Order Algebraic Ordinary Difference Equations*, 2019, in preparation.

3. Carlos Arreche and Yi Zhang. *Computation of the unipotent radical of the differential Galois group for a parameterized linear differential equation*, 2019, in preparation.

4. Zhimin Sun, Xiangyong Zeng and Yi Zhang. *The relation between the maximum order omplexity and expansion complexity of finite length sequences*, 2019, in preparation.

5. Maximilian Jaroschek and Yi Zhang. *Desingularization for Linear Mahler Operators*, 2019, in preparation.

6. Nobuki Takayama, Lin Jiu, Satoshi Kuriki and Yi Zhang. *Computations of the Expected Euler Characteristic for the Largest Eigenvalue of a Real Wishart Matrix*, 2019, arXiv:1903.10099, submitted.

7. Thieu N. Vo and Yi Zhang. *Rational Solutions of First-Order Algebraic Ordinary Difference Equations*, 2019, arXiv:1901.11048, submitted.

8. Thieu N. Vo and Yi Zhang. *Rational Solutions of High-Order Algebraic Ordinary Differential Equations*, 2018, arXiv:1709.04174, accepted by Journal of Systems Science and Complexity.

9. Shaoshi Chen, Manuel Kauers, Ziming Li and Yi Zhang. *Apparent Singularities of D-finite Systems*, 2019. *Journal of Symbolic Computation*, 95, pp. 217-237, 2019. arXiv:1705.00838, DOI:10.1016/j.jsc.2019.02.009.

10. Ting Guo, Christian Krattenthaler and Yi Zhang. *On (shape-)Wilf-equivalence for words*, 2018. *Advances in Applied Mathematics*, 100, pp. 87-100, 2018. DOI:10.1016/j.aam.2018.05.006, arXiv:1802.09856.

11. Christoph Koutschan and Yi Zhang. *Desingularization in the q-Weyl Algebra. Advances in Applied Mathematics*, 97, pp. 80–101, 2018. DOI: 10.1016/j.aam.2018.02.005, arXiv:1801.04160.

12. Yi Zhang. *Contraction of Ore Ideals with Applications*. In *Proceedings of the 2016 International Symposium on Symbolic and Algebraic Computation*, pp. 413-420, ACM Press, 2016. DOI:10.1145/2930889.2930890. [Distinguished Student Author Award]

Research Notes

- N. Thieu Vo, Sebastian Falkensteiner and Yi Zhang. *Formal Power Series Solutions of Algebraic Ordinary Differential Equations*, 2018, arXiv:1803.09646.

- Yi Zhang. *Testing q-shift Equivalence of Polynomials*, July, 2017.
- Yi Zhang. *Integer Vectors of a Fundamental Parallelepiped*, 2016.
- Ziming Li and Yi Zhang. *A Note on Gröbner Bases of Ore Polynomials over a PID*, 2016. https://yzhang1616.github.io/GB.pdf

Software

- Mihailovs_Conjecture.nb, a Mathematica notebook for proving Mihailovs' conjecure by the method of creative telescoping. It is based on joint work with Jordan Tirrell and Bruce W. Westbury. The notebook requires the availability of Koutschan's package HolonomicFunctions.m.
- ansatz.m, a Mathematica package for computing the expansion complexity of a given finite length sequences. It is based on joint work with Zhimin Sun and Xiangyong Zeng.
- TestNonvanishing.nb, a Mathematica notebook for checking the nonvanishing property of algebraic ordinary differential equations in Kamke's collection. It is based on joint work with Sebastian Falkensteiner and N. Thieu Vo. The notebook requires the availability of the Mathematica package Kamke_ODE.m.
- zof.m, a Mathematica package for generating 0-1-fillings of a Ferrers board (shape), checking the number of sigma-avoiding 0-1-fillings of a Ferrers board, generating generalized 0-1-fillings of a Ferrers board, and checking the number of generalized 0-1-fillings of a Ferrers board with weight n such that the longest ne-chain has length u and the longest se-chain has length v. It is based on joint work with Ting Guo and Christian Krattenthaler. For a demonstration of the package, see the zof.nb notebook.
- Example1_HGM.nb, a Mathematica notebook for the demonstration of the holonomic gradient method for the evaluation of expection of an Euler characteristic number. It is based on joint work with Satoshi Kuriki and Nobuki Takayama. The notebook requires the availability of Koutschan's package HolonomicFunctions.m.
- KamkeODEs.mw, a Maple worksheet for checking the (completely) maximal comparability and noncriticality of algebraic ordinary differential equations in Kample's collection. It is based on joint work with Dr. Thieu Vo Ngoc. The worksheet requires the availability of the Maple package KamkeODEs.mpl.
- qDesingularization.m, a Mathematica package for computing desingularized operators and the q-Weyl closure of a given q-difference operator in the first q-Weyl algebra. It is based on joint work with Dr. Christoph Koutschan. The package requires the availability of Koutschan's package HolonomicFunctions.m and Kauer's pacakge Singular.m. For a description of the usage of the package, see the Example.nb notebook.

Talks

1. *Computations of the Expected Euler Characteristic for the Largest Eigenvalue of a Real Wishart Matrix.* Invited talk at Johann Radon Institute for Computational and Applied Mathematics (RICAM), Austrian Academy of Sciences, Austria, May, 2019.

2. *Desingularization in the q-Weyl algebra.* Invited talk at Key Laboratory of Mathematics Mechanization, Academy of Mathematics and Systems Sciences, Chinese Academy of Sciences, Beijing, China, July, 2018.

3. *Desingularization in the q-Weyl algebra.* Contributed talk at at ACA'18 (the 24th Conference on Applications of Computer Algebra), the Faculty of Mathematics, The University of Santiago de Compostela, Santiago, Spain, June, 2018.

4. *Laurent Series Solutions of Algebraic Ordinary Differential Equations.* Invited talk at Computer Algebra Seminar, Research Institute for Symbolic Computation (RISC), Johannes Kepler University Linz, Austria, November, 2017.

5. *Apparent Singularities of D-finite Systems.* Contributed talk at ACA'17 (the 23rd Conference on Applications of Computer Algebra), Jerusalem College of Technology, Jerusalem, Israel, July, 2017.

6. *Contraction of Linear Difference and Differential Operators.* Contributed talk at ISSAC'16 (the 41st International Symposium on Symbolic and Algebraic Computation), Wilfrid Laurier University, Waterloo, Canada, July, 2016.

7. *Contraction of Linear Difference and Differential Operators.* Invited talk at the seminar of Center for Combinatorics, Nankai University, Tianjin, China, June, 2016.

8. *An Algorithm for Contraction of an Ore Ideal.* Invited talk at the seminar of Institute of Discrete Mathematics and Geometry, Vienna University of Technology, Vienna, Austria, October, 2015.

9. *The Restriction Problem for D-finite Functions.* Contributed talk at the Workshop on Computational and Algebraic Methods in Statistics, The University of Tokyo, Tokyo, Japan, March, 2015.

10. *An Algorithm for Decomposing Multivariate Hypergeometric Terms.* Contributed talk at CM'13 (the 5th National Conference of Computer Mathematics), Jilin University, Changchun, China, August, 2013.

Peer-Reviewing Activities

For each journal and conference the number of completed reviews in given in parentheses.

- Conferences on Applications of Computer Algebra (1)
- Journal of Systems Science and Complexity (1)
- Journal of Computational and Applied Mathematics (1)

- Advances in Applied Mathematics (1)
- International Symposiums on Symbolic and Algebraic Computation (2)
- Journal of Symbolic Computation (3)

Further Skills

- Programming Skills: C, Matlab, Maple, Mathematica, Macaulay2, Sage and Python
- Spoken Language: Chinese (native), English (fluent), German (basic)