Lin JIU CURRICULUM VITAE

CONTACT

Assistant Professor of Mathematics
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EMPLOYMENT

2023.08–	Assistant Professor of Mathematics	Duke Kunshan University
2020.08–2023.07	Lecturer in Mathematics	Duke Kunshan University
	Assistant Professor of the Practice	Duke University
2019.09–2020.07	Research Associate	*Mentor:Karl Dilcher*
	Department of Mathematics and Statistics, Dalhousie University	
2017.09–2019.08	Killam Postdoctoral Fellowship	*Mentor:Karl Dilcher*
	Department of Mathematics and Statistics, Dalhousie University	
2017.03–2017.08	Postdoctoral Research Scientist,	*Mentor: Christoph Koutschan*
	Johann Radon Institute for Computational and Applied Mathematics, Austrian Academy of Sciences	
2016.06–2017.02	Post-Doc Fellow,	*Mentors: Peter Paule & Carsten Schneider*
	Research Institute for Symbolic Computation, Johannes Kepler University	

EDUCATION

2011.08–2016.05	Tulane University, Ph.D. in Mathematics	*Advisor: Victor Hugo Moll*
2013.09–2014.02	Research Institute for Symbolic Computation, Johannes Kepler University	
	Exchange Ph.D. Student	*Advisor: Carsten Schneider*
2008.09–2010.07	Beijing Institute of Technology, Master of Science (Mathematics)	*Advisor: Huafei Sun*
2004.09–2008.06	Beijing Institute of Technology, Bachelor of Science (Mathematics)	

RESEARCH INTERESTS

Symbolic Computation, Number Theory, Combinatorics, Special Functions

GRANT AWARDED

2023.07–2025.06	WHU-DKU Joint Grant Seed	Wuhan University and Duke Kunshan University
	DKU PI of "Wuhan University-Duke Kunshan University-Dalhousie University Research Platform on Combinatorics and Number Theory"	
2022.07–2024.06	WHU-DKU Joint Grant Seed	Wuhan University and Duke Kunshan University
	Research team member of Dr. Dongmian Zou, Duke Kunshan University	
2022.01–2022.12	Gradescope Research Project Grant	Gradescope
	Facilitated by Center for Teaching and Learning at Duke Kunshan University	
	Gradescope for math courses.	
2021.07–2023.06	Interdisciplinary Seed Grant	Duke Kunshan University
	Joint with Dr. Myung-Joong Huang, Duke Kunshan University	
	Quantum algorithms for computational number theory, linear algebra, and combinatorics	
2017.09–2019.08	Killam Research Fund	Killam Trust @ Dalhousie University
	Research Support for Killam Postdocs	

PUBLICATIONS

(While working on the papers, undergraduate students are marked with a *)

1. S. Chern, **L. Jiu**, and I. Simonelli, A central limit theorem for a card shuffling problem, Submitted for Publication.
2. **L. Jiu** and D. Y. H. Shi, On b-ary binomial coefficients with negative entries, Submitted for Publication.
3. S. Chern and **L. Jiu**, Hankel determinants and Jacobi continued fractions for q-Euler numbers, To Appear in *C. R. Math. Acad. Sci. Paris.*
4. **L. Jiu** and Y. Li*, Hankel determinants of certain sequences of Bernoulli polynomials: A direct proof of an inverse matrix entry from Statistics, To Appear in *Contrib. Discrete Math.*
5. K. Dilcher and **L. Jiu**, Hankel determinants of shifted sequences of Bernoulli and Euler numbers, To Appear in *Contrib. Discrete Math*.
6. Z. Bradshaw, I. Gonzalez, **L. Jiu**, V. H. Moll, and C. Vignat, Compatibility of the method of brackets with classical integration rules, *Open Math*. **21** (2023), Article number: 20220581.

7. **L. Jiu** and D. Y. H. Shi, Moments and cumulants on identities for Bernoulli and Euler numbers, *Math. Reports* **24** (2022), 643–650.
8. **L. Jiu** I. Simonelli, and H. Yue*, Loop Decompositions of Random Walks and Nontrivial Identities of Bernoulli and Euler Polynomials, *Integers*, **22** (2022), A91.
9. K. Dilcher and **L. Jiu**, Hankel Determinants of sequences related to Bernoulli and Euler Polynomials, *Int. J. Number Theory* **18** (2022), 331–359.
10. K. Dilcher and **L. Jiu**, Orthogonal polynomials and Hankel determinants for certain Bernoulli and Euler polynomials, *J. Math. Anal. Appl*. **497** (2021), Article 124855.
11. I. Gonzales, **L. Jiu**, and V. H. Moll, An extension of the method of brackets. Part 2, *Open Math*. **18** (2020), 983–955.
12. **L. Jiu** and C. Koutschan, Calculation and properties of zonal polynomials, *Math. Comput. Sci*. **14** (2020), 623–640.
13. N. Takayama, **L. Jiu**, S. Kuriki, and Y. Zhang, Computations of the Expected Euler Characteristic for the Largest Eigenvalue of a Real Wishart Matrix, *J. Multivariate Anal.* **179** (2020), Article 104642.
14. **L. Jiu**, C. Vignat, and T. Wakhare, Analytic Continuation for Multiple Zeta Values using Symbolic Representations, *Int. J. Number Theory* **16** (2020), 579–602.
15. **L. Jiu** and C. Vignat, Connection coefficients for higher-order Bernoulli and Euler polynomials: a random walk approach, *Fibonacci Quart*. **57** (2019), 84–95.
16. **L. Jiu** and D. Y. H. Shi, Matrix representation for multiplicative nested sums, *Colloq. Math*. **158** (2019), 183–194.
17. **L. Jiu** and D. Y. H. Shi, Orthogonal polynomials and connection to generalized Motzkin numbers for higher-order Euler polynomials, *J. Number Theory* **199** (2019), 389–402.
18. I. Gonzalez, K. Kohl, **L. Jiu**, and V. H. Moll, The method of brackets in experimental mathematics, *Frontiers of Orthogonal Polynomials and q-Series*, Z. Nashed and X. Li eds., World Scientific Publishers, 2018.
19. **L. Jiu**, V. H. Moll, and C. Vignat, A symbolic approach to multiple zeta values at the negative integers, *J. Symbolic Comput*. **84** (2018), 1–13.
20. I. Gonzales, K. Kohl, **L. Jiu**, and V. H. Moll, An extension of the method of brackets. Part 1, *Open Math*. **15** (2017), 1181–1211.
21. **L. Jiu**, Integral representations of equally positive integer-indexed harmonic sums at infinity, *Research in Number Theory* **3** (2017), Article 3:10.
22. C. Li, E. Zhang, **L. Jiu**, and H. Sun, Optimal control on special Euclidean group via natural gradient descent algorithm, *Sci. China Inf. Sci*. **59** (2016), Article: 112203.
23. I. Gonzalez, **L. Jiu**, and V. H. Moll, Pochhammer symbol with negative indices. A new rule for the method of brackets, *Open Math*. **14** (2016), 681–686.
24. T. Amdeberhan, A. Dixit, X. Guan, **L. Jiu**, A. Kuznetsov, V. H. Moll, and C. Vignat, The integrals in Gradshteyn and Ryzhik. Part 30: trigonometric functions, *Scientia Series A: Mathematical Sciences* **27** (2016), 47–74.
25. T. Amdeberhan, A. Dixit, X. Guan, **L. Jiu**, V. H. Moll, and C. Vignat, A series involving Catalan numbers. Proofs and demonstrations, *Elem. Math*. **71** (2016), 109–121.
26. **L. Jiu** and C. Vignat, On binomial identities in arbitrary bases, *J. Integer Seq*. **19** (2016), Article 16.5.5.
27. **L. Jiu**, V. H. Moll, and C. Vignat, A symbolic approach to some identities for Bernoulli-Barnes polynomials, *Int. J. Number Theory* **12** (2016), 649–662.
28. A. Dixit, **L. Jiu**, V. H. Moll, and C. Vignat, The finite Fourier transform of classical polynomials, *J. Aust. Math. Soc*. **98** (2015), 145–160.
29. T. Amdeberhan, A. Dixit, X. Guan, **L. Jiu** and V. H. Moll, The unimodality of a polynomial coming from a rational integral. Back to the original proof, *J. Math. Anal. Appl*. **420** (2014), 1154–1166.
30. A. Byrnes*, **L. Jiu**, V. H. Moll, and C. Vignat, Recursion rules for the hypergeometric zeta functions, *Int. J. Number Theory* **10** (2014), 1761–1782.
31. **L. Jiu**, V. H. Moll, and C. Vignat, Identities for generalized Euler polynomials, Integral Transforms *Spec. Funct*. **25** (2014), 777–789.
32. Z. Zhang, H. Sun, **L. Jiu**, and L. Peng, A natural gradient algorithm for stochastic distribution systems, *Entropy* **16** (2014), 4338–4352.
33. F. Zhang, H. Sun, **L. Jiu**, and L. Peng, The arc length variational formula on the exponential manifold, *Math. Slovaca* **63** (2013), 1101–1112.
34. L. Peng, H. Sun, and **L. Jiu**, The geometric structure of the Pareto distribution, *Bol. Asoc. Mat. Venez*. **14** (2007), 5–13.
35. **L. Jiu** and H. Sun, On minimal homothetical hypersurfaces, *Colloq. Math*. 109 (2007), 239–249.
36. X. Wang and **L. Jiu**, Characterizing hypersurfaces of generalized rotation through its normal lines, *Journal*

of Ningde Normal University (Natural Science) **02** (2006), 117–119.

INVITED TALKS

1. **Random Walk Models for Identities Involving Bernoulli and Euler Polynomials**
   Invited Seminar Talk, Department of Mathematics and Statistics, Dalhousie University, Halifax, NS, Canada, Mar. 6, 2023.
2. **Random Walk Model on Finite Number of Sites**
   Invited Seminar Talk, School of Mathematics, Anhui University, Online, Oct. 19, 2022.
3. **Bernoulli Symbol and Multiple Zeta Function at Non-negative Integers**
   The First International Conference on Multiple Zeta Values and Related Topics, Online, Aug. 08–09, 2022.
4. **Hankel Determinants of Certain Sequences of Bernoulli and Euler Polynomials**
   Invited Seminar Talk, Department of Mathematics, Zhejiang Sci-Tech University, Online, June 12, 2022.
5. **Bernoulli and Euler Symbols: Umbral Calculus, Random Variables, and Multiple Zeta Values**
   Duke Kunshan University-Shanghai Jiao Tong University Joint Workshop for Mathematics and Data Science, Shanghai, P. R. China, Jan. 5, 2022.
6. **Random Walk Models for Non-trivial Identities Involving Bernoulli and Euler Polynomials of Higher-orders**
   Suzhou Area Youth Mathematicians 2nd Annual Workshop, Soochow University, Kunshan, Suzhou, Jiangsu Province, P. R. China, Sept. 25–26, 2021.
7. **Random Walks and Identities Involving Bernoulli and Euler Polynomials of Higher-order**
   Invited Seminar Talk, Institute of Statistics and Big Data, Renmin University of China, Beijing, P. R. China, June 18, 2021.
8. **Examples on Computer Proofs**
   Invited Seminar Talk, Wuhan University, Wuhan, Hubei Province, P. R. China, May 28, 2021.
9. **Hankel Determinant of Sequences Related to Bernoulli and Euler Polynomials**
   DKU-WHU Math and Stat Academic Conference, Wuhan University, Wuhan, Hubei Province, P. R. China, May 28, 2021.
10. **Hankel Determinant on Sequences Related to Bernoulli and Euler Polynomials**
    Suzhou Area Youth Mathematicians 1st Annual Workshop, Duke Kunshan University, Kunshan, Suzhou, Jiangsu Province, P. R. China, Nov. 14–15, 2020.
11. **Three Examples on Computer Proofs**
    Zu Chongzhi Colloquium Series, Duke Kunshan University, Kunshan, Suzhou, P. R. China, Nov. 6, 2020.
12. **Orthogonal Polynomials for Higher-order Euler Polynomials**
    15th International Symposium on Orthogonal Polynomials, Special Functions and Applications, Hagenberg, Austria, July 22–26, 2019.
13. **On Harmonic Sums: Integral and Matrix Representations with Connections to Partition-theoretic Generalization of the Riemann Zeta-function and Random Walks**
    Analytic and Combinatorial Number Theory: The Legacy of Ramanujan (A conference in honor of Bruce C. Berndt's 80th birthday), University of Illinois at Urbana-Champaign, Urbana, IL, U. S. A., June 6–9, 2019.
14. **Random Walk Approaches to Identities on Higher-order Bernoulli and Euler Polynomials**
    American Mathematical Society Spring Southeastern Sectional Meeting, Auburn University, Auburn, AL, U. S. A., Mar. 15–17, 2019.
15. **Matrix Representation for Higher-Order Euler Polynomials**
    2019 Joint Mathematics Meetings, Baltimore, MD, U. S. A., Jan. 16–19, 2019.
16. **Bernoulli Symbol and Sum of Powers**
    6th International Congress on Mathematical Software, University of Notre Dame, Notre Dame, IN, U. S. A., July 24–27, 2018.
17. **Random Walks and Identities for High-order Bernoulli and Euler Polynomials**
    18th International Conference on Fibonacci Numbers and Their Applications, Dalhousie University, Halifax, NS, Canada, July 1–8, 2018.
18. **Matrix Representations for Bernoulli and Euler Polynomials**
    2018 Canadian Mathematical Society Summer Meeting, University of New Brunswick, Fredericton, NB, Canada, June 1–4, 2018.
19. **The Probabilistic and Combinatorial Interpretations of the Bernoulli Symbol**
    2017 Canadian Mathematical Society Winter Meeting, University of Waterloo, Waterloo, ON, Canada, Dec. 8–11, 2017.
20. **Bernoulli Symbol on Multiple Zeta Values at Negative Integers**

23rd Conference on Applications of Computer Algebra (Commemorating the heritage of Jonathan Michael Borwein), Jerusalem College of Technology, Jerusalem, Israel, July 17–21, 2017.

21. **On Bernoulli Symbol $\mathscr{B}$**
Klagenfurt-Linz-Wien Workshop, Riefnitz, Austria, May 3–6, 2017.
22. **The Method of Brackets (MoB) and Integrating by Differentiating (IbD) Method**
Laboratoire des Signaux et Systemès, Universitė Paris Sud XI, Orsay, France, Dec. 9, 2016.
23. **"Random Walks" for Harmonic Sums**
SFB Statusseminar, Strobl, Austria, Nov. 27–30, 2016.
24. **On Binomial Identities in Arbitrary Bases**
Beijing Key Laboratory on Mathematical Characterization, Analysis and Applications of Complex Information, Beijing Institute of Technology, Beijing, China, July 26, 2016.
25. **Random Walk: A Probabilistic and Geometric Approach to Number Theory**
International Conference on Mathematical Characterization, Analysis and Applications of Complex Information, Beijing Institute of Technology, Beijing, China, July 19–20, 2016.
26. **The Method of Brackets**
5th International Congress on Mathematical Software, The Zuse Institute Berlin, Berlin, Germany, July 11–14, 2016.
27. **On Bernoulli Symbol $\mathscr{B}$ and Its Applications**
Center for Combinatorics, Nankai University, Tianjin, China, July 8, 2015.
28. **Recursion Rules for the Hypergeometric Zeta Functions**
Midwest Number Theory Conference for Graduate Students and Recent PhDs, X, University of Illinois at Urbana-Champaign, Urbana, IL, U. S. A., June 3–4, 2014.
29. **Implementation of an Algorithm on Converting Sums into Nested Sums**
Laboratoire des Signaux et Systemes, Universitė Paris Sud XI, Orsay, France, Jan. 8, 2014.

HONORS AND AWARDS

2015–2016	Tea Doctor (for organizing departmental Tea Time)	(Math Dept., Tulane Univ.)
2014–2015	Tea Master (for organizing departmental Tea Time)	(Math Dept., Tulane Univ.)
2013–2014	Excellence in Mathematics	(Math Dept., Tulane Univ.)
2012–2013	Excellent Graduate Student Teacher	(Math Dept., Tulane Univ.)
2008	Outstanding Graduates	(Beijing Institute of Technology)
2007	National Scholarship	(Department of Education, P. R. China)
2006	China Aerospace Science and Technology Corporation (CASC) Scholarship	(CASC)

TEACHING EXPERIENCE

DUKE KUNSHAN UNIVERSITY

2023 Fall	MATH 105	Calculus
	MATH 202	Linear Algebra
	MATH 105	Calculus
	MATH 301	Advanced Introduction to Probability
2023 Spring	MATH 205	Probability and Statistics
	MINITERM 102	Experimental Mathematics and Symbolic Computation
2022 Fall	INDSTU 391	Introduction to Algebraic Geometry
	MATH 105	Calculus
	MATH 306	Number Theory
	MATH 301	Advanced Introduction to Probability
2022 Spring	INDSTU 391	Variational Quantum Algorithms
	MATH 201	Multivariable Calculus
	MATH 301	Advanced Introduction to Probability
	MATH 201	Multivariable Calculus
2021 Fall	MATH 105	Calculus
	INDSTU 391	Riemann Zeta-Function
	INDSTU 391	Quantum Algorithm
	MATH 306	Number Theory
	INDSTU 391	Combinatorics
2021 Spring	MATH 205	Probability and Statistics
	MATH 301	Advanced Introduction to Probability
2020 Fall	MATH 105	Calculus
	MATH 201	Multivariable Calculus

DALHOUSIE UNIVERSITY

2019 Summer	MATH 1030	Matrix Theory and Linear Algebra I
2019 Winter	MATH 3080	Introduction to Complex Variables

TULANE UNIVERSITY

2016 Spring	MATH 1060	Long Calculus II
2015 Fall	MATH 1310	Consolidated Calculus
2015 Spring	MATH 1210	Long Calculus I
2014 Summer	MATH 1160	Long Calculus II

RELEVANT SKILLS

Language: Mandarin (native), English (fluent)

Computer: Mathematica, SageMath, Python, Maple, LaTeX, LyX

Packages: Zonal.sage `https://jiulin90.github.io/Packages/Zonal.sage`
BNE.sage `https://jiulin90.github.io/Packages/BNE.sage`