# *Lin JIU* CURRICULUM VITAE

## CONTACT


Duke Kunshan University
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## EMPLOYMENT

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

## 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<br>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

## PUBLICATIONS

**34.** K. Dilcher and **L. Jiu**, Hankel Determinants of shifted sequences of Bernoulli and Euler numbers, Submitted for Publication.

**33.** **L. Jiu**, V. H. Moll, and C. Vignat, Compatibility of the method of brackets with classical integration methods, Submitted for Publication.

**32.** **L. Jiu** and D. Y. H. Shi, On b-ary binomial coefficients with negative entries, Submitted for Publication.

**31.** Y. Li, B. Li, H. Sun, and **L. Jiu**, Application of entropy in Riemannian manifolds, Submitted for Publication.

**30.** Y. Li, B. Li, H. Sun, and **L. Jiu**, Matrix geometric means and uncertainty relation, Submitted for Publication.

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**29.** **L. Jiu** and D. Y. H. Shi, Moments and cumulants on identities for Bernoulli and Euler numbers, To Appear in *Math. Rep. (Bucur.)*

**28.** K. Dilcher and **L. Jiu**, Hankel Determinants of sequences related to Bernoulli and Euler Polynomials, To Appear in *Int. J. Number Theory.*

**27.** K. Dilcher and **L. Jiu**, Orthogonal polynomials and Hankel determinants for certain Bernoulli and Euler polynomials, *J. Math. Anal. Appl*. **497** (2021), Article 124855.

**26.** I. Gonzales, **L. Jiu**, and V. H. Moll, An extension of the method of brackets. Part 2, *Open Math*. **18** (2020), 983–955.

**25.** **L. Jiu** and C. Koutschan, Calculation and properties of zonal polynomials, *Math. Comput. Sci*. **14** (2020), 623–640.

**24.** 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.

**23.** **L. Jiu**, C. Vignat, and T. Wakhare, Analytic Continuation for Multiple Zeta Values using Symbolic Representations, *Int. J. Number Theory* **16** (2020), 579–602.

**22.** **L. Jiu** and C. Vignat, Connection coefficients for higher-order Bernoulli and Euler polynomials: a random walk approach, *Fibonacci Quart*. **57** (2019), 84–95.

**21.** **L. Jiu** and D. Y. H. Shi, Matrix representation for multiplicative nested sums, *Colloq. Math*. **158** (2019), 183–194.

**20.** **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.

**19.** 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.

**18.** **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.

**17.** 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.

**16.** **L. Jiu**, Integral representations of equally positive integer-indexed harmonic sums at infinity, *Research in Number Theory* (2017), Article 10.

**15.** 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.

**14.** 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.

**13.** 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.

**12.** 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.

**11.** **L. Jiu** and C. Vignat, On binomial identities in arbitrary bases, *J. Integer Seq*. **19** (2016), Article 16.5.5.

**10.** **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.

**9.** 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.

**8.** 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.

**7.** 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.

**6.** **L. Jiu**, V. H. Moll, and C. Vignat, Identities for generalized Euler polynomials, Integral Transforms *Spec. Funct*. **25** (2014), 777–789.

**5.** Z. Zhang, H. Sun, **L. Jiu**, and L. Peng, A natural gradient algorithm for stochastic distribution systems, *Entropy* **16** (2014), 4338–4352.

**4.** F. Zhang, H. Sun, **L. Jiu**, and L. Peng, The arc length variational formula on the exponential manifold, *Math. Slovaca* **63** (2013), 1101–1112.

**3.** L. Peng, H. Sun, and *L. Jiu*, The geometric structure of the Pareto distribution, *Bol. Asoc. Mat. Venez*. **14** (2007), 5–13.

**2.** **L. Jiu** and H. Sun, On minimal homothetical hypersurfaces, *Colloq. Math*. 109 (2007), 239–249.

**1.** 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

**23.** **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.

**22.** **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.

**21.** **Examples on Computer Proofs**
*Invited Seminar Talk*, Wuhan University, Wuhan, Hubei Province, P. R. China, May 28, 2021.

**22.** **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.

**20.** **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.

**19.** **Three Examples on Computer Proofs**
*Zu Chongzhi Colloquium Series,* Duke Kunshan University, Kunshan, Suzhou, P. R. China, Nov. 6, 2020.

**18.** **Orthogonal Polynomials for Higher-order Euler Polynomials**
*15th International Symposium on Orthogonal Polynomials, Special Functions and Applications*, Hagenberg, Austria, July 22–26, 2019.

17. **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.
16. **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
14. **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.
13. **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.
12. **Matrix Representations for Bernoulli and Euler Polynomials**
*2018 Canadian Mathematical Society Summer Meeting*, University of New Brunswick, Fredericton, NB, Canada, June 1–4, 2018.
11. **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.
10. **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.
9. **On Bernoulli Symbol $\mathscr{B}$**
*Klagenfurt-Linz-Wien Workshop*, Riefnitz, Austria, May 3–6, 2017.
8. **The Method of Brackets (MoB) and Integrating by Differentiating (IbD) Method**
*Laboratoire des Signaux et Systemès, Université Paris Sud XI*, Orsay, France, Dec. 9, 2016.
7. **"Random Walks" for Harmonic Sums**
*SFB Statusseminar*, Strobl, Austria, Nov. 27–30, 2016.
6. **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.
5. **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.
4. **The Method of Brackets**
*5th International Congress on Mathematical Software*, The Zuse Institute Berlin, Berlin, Germany, July 11–14, 2016.
3. **On Bernoulli Symbol $\mathscr{B}$ and Its Applications**
*Center for Combinatorics, Nankai University*, Tianjin, China, July 8, 2015.
2. **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.
1. **Implementation of an Algorithm on Converting Sums into Nested Sums**
*Laboratoire des Signaux et Systemes, Université 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

| | | | |
|---|---|---|---|
| 2021 Fall | MATH 105 | Calculus | @ Duke Kunshan University |
| | INDSTU 391: | Riemann Zeta-Function | @ Duke Kunshan University |
| | INDSTU 391: | Quantum Algorithm | @ Duke Kunshan University |
| | MATH 301 | Number Theory | @ Duke Kunshan University |
| | INDSTU 391: | Combinatorics | @ Duke Kunshan University |
| 2021 Spring | MATH 205 | Probability and Statistics | @ Duke Kunshan University |
| | MATH 301 | Advanced Introduction to Probability | @ Duke Kunshan University |
| 2020 Fall | MATH 105 | Calculus | @ Duke Kunshan University |
| | MATH 201 | Multivariable Calculus | @ Duke Kunshan University |
| 2019 Summer | MATH 1030 | Matrix Theory and Linear Algebra I | @ Dalhousie University |
| 2019 Winter | MATH 3080 | Introduction to Complex Variables | @ Dalhousie University |
| 2016 Spring | MATH 1160 | Long Calculus II | @ Tulane University |
| 2015 Fall | MATH 1310 | Consolidated Calculus | @ Tulane University |
| 2015 Spring | MATH 1210 | Long Calculus I | @ Tulane University |
| 2014 Summer | MATH 1160 | Long Calculus II | @ Tulane University |

## RELEVANT SKILLS

**Language:** Mandarin (native), English (fluent)

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

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