Zipei Nie

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Education

Princeton University	Princeton, NJ, USA
Ph.D. in Mathematics	*Sep 2015 – Jun 2020*

Advisor: Zoltán Szabó
Thesis: On $(1, 1)$-knots and L-space conjecture

Massachusetts Institute of Technology	Cambridge, MA, USA
B.S. in Mathematics	*Sep 2011 – Jun 2015*

Employment

Lagrange Mathematics and Computing Research Center, Huawei	Paris, France
Senior Researcher in Mathematics	*May 2021 – present*
Nine-Chapter Lab, Huawei	Shanghai, China
Senior Researcher in Mathematics	*July 2020 – May 2021*
Citadel Securities	Chicago, IL, USA
Quantitative Researcher Internship	*May 2019 – Aug 2019*

Awards

Huawei, ERI President Award	*2022*
Huawei, Future Star Award	*2020, 2021*
Alibaba Global Mathematics Competition	
Honorable Mention in Geometry & Topology	*2020*
Silver Award in Geometry & Topology	*2018*
Princeton University, Centennial Fellowship	*2015*
MIT, Hartley Rogers Jr. Prize	*2013*
William Lowell Putnam Math Competition	
Putnam Fellow	*2012, 2013, 2014*
Top Twenty-five	*2011*
Gold Medal in International Mathematical Olympiad	*2010*
Gold Medal in Romanian Master of Mathematics	*2010*

Research Interests

Low dimensional topology, random matrix theory, algorithm, combinatorics.

Teaching

Lecturer, Mathematical Olympiad Training Program, Shanghai	*2013, 2014, 2020*
Organizer & Instructor, Putnam Training Sessions, Princeton University	*2015, 2017, 2019*
Teacher, Educational Studies Program, Massachusetts Institute of Technology	*2013*

Research Papers

1. Zhiyi Huang, Chris Lambert, Zipei Nie, and Richard Peng. Simpler analyses of union-find. *arXiv preprint arXiv:2308.09021*, 2023

2. Zipei Nie and Hang Zhou. Euclidean capacitated vehicle routing in random setting: A 1.55-approximation algorithm. *arXiv preprint arXiv:2304.11281*, 2023

3. Zipei Nie. On a conjecture of Knuth about forward and back arcs. *arXiv preprint arXiv:2301.05704*, 2023

4. Zipei Nie. The number of correct guesses with partial feedback. *arXiv preprint arXiv:2212.08113*, 2022

5. Zipei Nie. Matrix anti-concentration inequalities with applications. In *Proceedings of the 54th Annual ACM SIGACT Symposium on Theory of Computing*, pages 568–581, 2022

6. Lin Li and Zipei Nie. Non-left-orderability of cyclic branched covers of pretzel knots $P(3, -3, -2k - 1)$. *Proceedings of the Japan Academy, Series A: Mathematical Sciences*, 98(10), 2022

7. Ruiquan Gao, Zhongtian He, Zhiyi Huang, Zipei Nie, Bijun Yuan, and Yan Zhong. Improved online correlated selection. In *2021 IEEE 62nd Annual Symposium on Foundations of Computer Science* (FOCS), pages 1265–1276. IEEE, 2022

8. Zipei Nie. An explicit description of $(1, 1)$ L-space knots, and non-left-orderable surgeries. *Communications of Huawei Research*, VOL-001:212–219, 2021

9. Zipei Nie. On 1-bridge braids, satellite knots, the manifold $v2503$ and non-left-orderable surgeries and fillings. *arXiv preprint arXiv:2003.14296*, 2020

10. Zipei Nie. Topologically slice $(1, 1)$-knots which are not smoothly slice. *arXiv preprint arXiv:1901.07774*, 2019

11. Zipei Nie. Left-orderablity for surgeries on $(-2, 3, 2s + 1)$-pretzel knots. *Topology and its Applications*, 261:1–6, 2019

12. Weibo Fu and Zipei Nie. Linear restrictions on cone polynomials. *arXiv preprint arXiv:1510.04630*, 2015

13. Zipei Nie. On the minimum area of null homotopies of curves traced twice. *arXiv preprint arXiv:1412.0101*, 2014

14. Zipei Nie and Anthony Y Wang. Hilbert functions and the finite degree Zariski closure in finite field combinatorial geometry. *Journal of Combinatorial Theory, Series A*, 134:196–220, 2015

15. Zipei Nie and Anthony Y Wang. Points on lines in $\mathbb{F}_q^3$. *MIT SPUR Final Papers*, 2013

Invited Talks

ETH Zürich Graduate Student Colloquium in Mathematics	*2023*
The 1st ACDA Workshop in Aussois	*2022*
ETH Zürich Algorithms and Complexity Seminar	*2022*
The 54th ACM Symposium on Theory of Computing	*2022*
The Nearly Carbon Neutral Geometric Topology Conference	*2020*
University of British Columbia Topology Seminar	*2020*

Professional Service

Reviewer for: SODA, ICALP, SOSA