

Yinfeng Zhu

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Date of Birth: 1990-09-25



Employment History

- 2023 – now  **Postdoc** Institute of Natural Sciences and Mathematics, Ural Federal University.
Advisor: Mikhail V. Volkov
- 2021 – 2023  **Postdoc** School of Mathematical Sciences, Shanghai Jiao Tong University.
Advisor: Cheng Wang
- 2022 – 2023  **Academic Visitor** Department of Mathematics, Imperial College London.
Advisor: Alexander Ivanov

Education

- 2014 – 2020  **Ph.D. Mathematics, Shanghai Jiao Tong University**
Thesis title: *Walks in Digraphs and Related Problems*.
Advisor: Yaokun Wu
- 2009 – 2013  **B.Sc. Materials Science and Engineering, Shanghai Jiao Tong University**

Research Interests

symbolic dynamics, automata, combinatorics on words, multivariate graph theory, graph homomorphism.

Research Papers

A book in preparation

- 1 A. Tian, Y. Wu, and **Y. Zhu**, *A Promenade in Combinatorics: Chinese Hawthorn in the Sun*.

Preprints

- 1 **Y. Zhu**, “A quadratic upper bound on the reset thresholds of synchronizing automata containing a transitive permutation group,” (accepted by FSTTCS 2024).  URL.
- 2 C. Qian, Y. Wu, and **Y. Zhu**, “Periods of strongly connected multivariate digraphs.”  URL.
- 3 Y. Wu and **Y. Zhu**, “BBT tree orders of countable connected graphs.”  URL.
- 4 **Y. Zhu**, “Road coloring problem for completely reachable automata.”  URL.

Publications

- 1 **Y. Zhu**, “Around Don’s conjecture for binary completely reachable automata,” in *Developments in language theory*, ser. Lecture Notes in Comput. Sci. Vol. 14791, Springer, Cham, [2024] ©2024, pp. 282–295, ISBN: 978-3-031-66158-7; 978-3-031-66159-4.  DOI.
- 2 Y. Wu and **Y. Zhu**, “Primitivity and Hurwitz primitivity of nonnegative matrix tuples: A unified approach,” *SIAM J. Matrix Anal. Appl.*, vol. 44, no. 1, pp. 196–211, 2023, ISSN: 0895-4798, 1095-7162.  DOI.
- 3 Y. Wu and **Y. Zhu**, “Submodular functions and rooted trees,” *Theory Comput. Syst.*, vol. 66, no. 6, pp. 1047–1073, 2022, ISSN: 1432-4350, 1433-0490.  DOI.

- 4 Y. Wu and **Y. Zhu**, “Top-heavy phenomena for transformations,” *Ars Math. Contemp.*, vol. 22, no. 4, Paper No. 9, 26, 2022, ISSN: 1855-3966,1855-3974. [DOI](#).
- 5 Y. Wu and **Y. Zhu**, “Weighted rooted trees: Fat or tall?” In *Computer science—theory and applications*, ser. Lecture Notes in Comput. Sci. Vol. 12159, Springer, Cham, 2020, pp. 406–418, ISBN: 978-3-030-50026-9; 978-3-030-50025-2. [DOI](#).
- 6 Y. Xiong, S. Zaw, and **Y. Zhu**, “Competition numbers and phylogeny numbers of connected graphs and hypergraphs,” *Algebra Colloq.*, vol. 27, no. 1, pp. 79–86, 2020, ISSN: 1005-3867,0219-1733. [DOI](#).
- 7 Y. Wu, Z. Xu, and **Y. Zhu**, “A five-element transformation monoid on labelled trees,” *European J. Combin.*, vol. 80, pp. 401–415, 2019, ISSN: 0195-6698,1095-9971. [DOI](#).
- 8 E. Bannai, D. Zhao, L. Zhu, Y. Zhu, and **Y. Zhu**, “Half of an antipodal spherical design,” *Arch. Math. (Basel)*, vol. 110, no. 5, pp. 459–466, 2018, ISSN: 0003-889X,1420-8938. [DOI](#).
- 9 Y. Wu, Z. Xu, and **Y. Zhu**, “Strongly connected multivariate digraphs,” *Electron. J. Combin.*, vol. 24, no. 1, Paper No. 1.47, 44, 2017, ISSN: 1077-8926. [DOI](#).
- 10 Y. Wu, Z. Xu, and **Y. Zhu**, “An expansion property of Boolean linear maps,” *Electron. J. Linear Algebra*, vol. 31, pp. 381–407, 2016, ISSN: 1081-3810. [DOI](#).
- 11 Y. Wu, Z. Xu, and **Y. Zhu**, “Average range of Lipschitz functions on trees,” *Mosc. J. Comb. Number Theory*, vol. 6, no. 1, pp. 96–116, 2016, ISSN: 2220-5438,2640-7361. [URL](#).
- 12 Y. Wu and **Y. Zhu**, “Lifespan in a strongly primitive Boolean linear dynamical system,” *Electron. J. Combin.*, vol. 22, no. 4, Paper 4.36, 21, 2015, ISSN: 1077-8926. [DOI](#).

Selected Talks

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| Aug 16, 2024 |  Around Don’s conjecture for binary completely reachable automata
<i>DLT 2024: Developments in Language Theory</i> , Göttingen, Germany. |
| Feb 01, 2024 |  Road coloring problem for completely reachability
<i>Modern Problems of Mathematics and Its Applications “International (55th All-Russian) Youth School-Conference”</i> , Ural Federal University. |
| Oct 12, 2023 |  Primitivity and hurwitz primitivity of nonnegative
<i>2023 Tianjing Workshop on Graph Theory and Combinatorics</i> , Nankai University. |
| Jun 23, 2022 |  Hurwitz primitivity and synchronizing automata
<i>24th Conference of the International Linear Algebra Society</i> , Galway, Ireland. |
| Jun 7, 2022 |  Automata with an almost constant rank property on words
<i>Ural Seminar on Group Theory and Combinatorics</i> , Yekaterinburg-Online. |
| Nov 7, 2021 |  Primitive matrix sets and synchronizing automata
<i>Workshop on Combinatorics, Graph Theory and Number Theory</i> , Southern University of Science and Technology University. |
| Jun 30, 2020 |  Weighted rooted trees: Fat or tall?
<i>Computer Science in Russia 2020</i> , online. |
| July 2, 2019 |  Unimodality and transformation semigroups
<i>2019 Workshop on Combinatorics and Quantum Information Theory</i> , Shanghai University. |
| May 31, 2019 |  Path-liftable digraph homomorphisms and non-liftable indices
<i>Canadian Discrete and Algorithmic Mathematics Conference</i> , Simon Fraser University. |
| Apr 11, 2019 |  Homogeneity of transformation semigroups
<i>Workshop on Dynamics and Information</i> , Shanghai Jiao Tong University. |

Selected Talks (continued)

- Aug 18, 2018  Phase spaces and kernel spaces of transformation semigroups
International Conference and PhD-Master Summer School on "Graphs and Groups, Representations and Relations", Novosibirsk State University.
- Jul 17, 2018  Multivariate digraphs and higher order Markov chains
International Workshop on Matrices and Operators, Shanghai University.
- Oct 31, 2016  Combinatorics of Discrete Dynamical Systems
International Workshop on Algebraic Combinatorics, Anhui University.

October 24, 2024