(Jephian) Chin-Hung Lin

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Department of Applied Mathematics
National Sun Yat-sen University
Kaohsiung 80424, Taiwan

EDUCATION

2017 Ph.D., Mathematics, Iowa State University (ISU)

2011 M.S., Mathematics, National Taiwan University (NTU)

2009 B.S., Mathematics, National Taiwan Normal University (NTNU)

RESEARCH INTERESTS

Algebraic graph theory; combinatorics; the inverse eigenvalue problem; graph algorithm; quantum information.

EMPLOYMENT/FELLOWSHIPS

2022–present Associate professor, National Sun Yat-sen University (NSYSU)

2019–2024 Young scholar fellowship (愛因斯坦培植計畫), Ministry of Science and Technology, Taiwan (於 2021 年獲選轉爲 2030 跨世代新秀學者計畫)

2018–2022 Assistant professor, NSYSU

2017–2018 Post-doctoral fellow, University of Victoria (UVic)

2016 Spring Wolfe fellowship, ISU

2014 Fall Long-term visitor, Institute of Mathematics and its Application (IMA)

HONORS

2017 Zaffarano Prize for Graduate Student Research, ISU

2016 Graduate college research/teaching excellence award, ISU

2013–2016 Government scholarship, Ministry of Education, Taiwan

2011 Excellent thesis award, Symposium for Young Combinatorists, Taiwan

2010 Scholarship of Mr. Dun-Fu Hu, NTU

2005–2008 Excellent student scholarship, NTNU

PROFESSIONAL SERVICES

Associate Editor of the *Electronic Journal of Linear Algebra*

Conference Editor of *IMAGE* — ILAS' Bulletin.

Referee for *Linear Algebra and its Applications*, *Journal of Combinatorial Optimization*, *Discrete Optimization*, *Special Matrices*, and *Discrete Applied Mathematics*, etc.

Assistant Conference Coordinator of the 21th International Linear Algebra Society (ILAS) Confernce, 2017.

PUBLICATIONS

Appeared/Accepted

29. S. M. Fallat, H. T. Hall, J. C.-H. Lin, and B. Shader. The bifurcation lemma for strong properties in the inverse eigenvalue problem of a graph. *Linear Algebra Appl.*, 648:70–87, 2022.
28. J. C.-H. Lin, P. Oblak, and H. Šmigoc. On the inverse eigenvalue problem for block graphs. *Linear Algebra Appl.*, 631:379–397, 2021.
27. F. H. J. Kenter and J. C.-H. Lin. A zero forcing technique for bounding sums of eigenvalue multiplicities. *Linear Algebra Appl.*, 629:138–167, 2021.
26. P. Hell, C. Hernandez-Cruz, J. Huang, and J. C.-H. Lin. Strong chordality of graphs with possible loops. *SIAM J. Discrete Math.*, 35:362–375, 2021.
25. L. Hogben, J. C.-H. Lin, D. D. Olesky, and P. van den Driessche. The sepr-sets of sign patterns. *Linear Multilinear Algebra*, 26:2044–2068, 2020.
24. P. Hell, J. Huang, J. C.-H. Lin, and R. M. McConnell. Bipartite analogues of comparability and cocomparability graphs. *SIAM J. Discrete Math.*, 34:1969–1983, 2020.
23. S. Butler, C. Erickson, S. M. Fallat, H. T. Hall, B. Kroschel, J. C.-H. Lin, B. Shader, N. Warnberg, and B. Yang. Properties of a q-analogue of zero forcing. *Graphs Combin.*, 36:1401–1419, 2020.
22. A. Chan, S. M. Fallat, S. Kirkland, J. C.-H. Lin, S. Nasserasr, and S. Plosker. Complex Hadamard diagonalisable graphs. *Linear Algebra Appl.*, 605:158–179, 2020.
21. J. C.-H. Lin, P. Oblak, and H. Šmigoc. The strong spectral property for graphs. *Linear Algebra Appl.*, 598:68–91, 2020.
20. W. Barrett, S. Butler, S. M. Fallat, H. T. Hall, L. Hogben, J. C.-H. Lin, B. Shader, and M. Young. The inverse eigenvalue problem of a graph: Multiplicities and minors. *J. Combin. Theory Ser. B*, 142:276–306, 2020.
19. D. Ferrero, M. Flagg, H. T. Hall, L. Hogben, J. C.-H. Lin, S. Meyer, S. Nasserasr, and B. Shader. Rigid linkages and partial zero forcing. *Electron. J. Combin.*, 26:#P2.43, 2019.
18. F. H. J. Kenter and J. C.-H. Lin. On the error of a priori sampling: Zero forcing sets and propagation time. *Linear Algebra Appl.*, 576:124–141, 2019.
17. C. A. Alfaro and J. C.-H. Lin. Critical ideals, minimum rank and zero forcing number. *Appl. Math. Comput.*, 358:305–313, 2019.
16. J. C.-H. Lin. Zero forcing number, Grundy domination number, and their variants. *Linear Algebra Appl.*, 563:240–254, 2019.
15. Y.-J. Cheng and J. C.-H. Lin. Graph families with constant distance determinant. *Electron. J. Combin.*, 25:#P4.45, 2018.
14. R. Anderson, S. Bai, F. Barrera-Cruz, É. Czabarka, G. Da Lozzo, N. L. F. Hobson, J. C.-H. Lin, A. Mohr, H. C. Smith, L. A. Székely, and H. Whitlatch. Analogies between the crossing number and the tangle crossing number. *Electron. J. Combin.*, 25:#P4.24, 2018.

13. G. Aalipour, A. Abiad, Z. Berikkyzy, L. Hogben, F. H. J. Kenter, J. C.-H. Lin, and M. Tait. Proof of a conjecture of Graham and Lovász concerning unimodality of coefficients of the distance characteristic polynomial of a tree. *Electron. J. Linear Algebra*, 34:373–380, 2018.
12. J. C.-H. Lin, D. D. Olesky, and P. van den Driessche. Sign patterns requiring a unique inertia. *Linear Algebra Appl.*, 546:67–85, 2018.
11. W. Barrett, S. M. Fallat, H. T. Hall, L. Hogben, J. C.-H. Lin, and B. Shader. Generalizations of the Strong Arnold Property and the minimum number of distinct eigenvalues of a graph. *Electron. J. Combin.*, 24:#P2.40, 2017.
10. A. Berliner, C. Bozeman, S. Butler, M. Catral, L. Hogben, B. Kroschel, J. C.-H. Lin, N. Warnberg, and M. Young. Zero forcing propagation time on oriented graphs. *Discrete Appl. Math.*, 224:45–59, 2017.
9. M. Dairyko, L. Hogben, J. C.-H. Lin, J. Lockhart, D. Roberson, S. Severini, and M. Young. Note on von Neumann and Rényi entropies of a graph. *Linear Algebra Appl.*, 521:240–253, 2017.
8. J. C.-H. Lin. Using a new zero forcing process to guarantee the Strong Arnold Property. *Linear Algebra Appl.*, 507:229–250, 2016.
7. S. Butler, C. Erickson, L. Hogben, K. Hogenson, L. Kramer, R. L. Kramer, J. C.-H. Lin, R. R. Martin, D. Stolee, N. Warnberg, and M. Young. Rainbow arithmetic progressions. *J. Comb.*, 7:595–626, 2016.
6. G. Aalipour, A. Abiad, Z. Berikkyzy, J. Cummings, J. De Silva, W. Gao, K. Heysse, L. Hogben, F. H. J. Kenter, J. C.-H. Lin, and M. Tait. On the distance spectra of graphs. *Linear Algebra Appl.*, 497:66–87, 2016.
5. J. C.-H. Lin. Odd cycle zero forcing parameters and the minimum rank of graph blowups. *Electron. J. Linear Algebra*, 31:42–59, 2016.
4. C. Bozeman, A. Ellsworth, L. Hogben, J. C.-H. Lin, G. Maurer, K. Nowak, A. Rodriguez, and J. Strickland. Minimum rank of graphs with loops. *Electron. J. Linear Algebra*, 27:907–934, 2014.
3. J. C.-H. Lin. The sieving process and lower bounds for the minimum rank problem. *Congr. Numer.*, 219:73–88, 2014.
2. G. J. Chang and J. C.-H. Lin. Counterexamples to an edge spread question for zero forcing number. *Linear Algebra Appl.*, 446:192–195, 2014.
1. J. C.-H. Lin. Some interpretations and applications of Fuss-Catalan numbers. *ISRN Discrete Math.*, 2011. doi:10.5402/2011/534628.

Submitted

a. L. Hogben, J. C.-H. Lin, and M. Young. Multi-part Nordhaus-Gaddum type problems for tree-width, Colin de Verdière type parameters, and Hadwiger number. `http://arxiv.org/abs/1604.08817`. (under review).
b. G. J. Chang and J. C.-H. Lin. Minimum rank of powers of cycles and trees. (under review).

Book/Others

3. L. Hogben, J. C.-H. Lin, and B. Shader. *Inverse Problems and Zero Forcing for Graphs.* American Mathematical Society, Providence, 2022.
2. S. M. Fallat, L. Hogben, J. C.-H. Lin, and B. Shader. The inverse eigenvalue problem of a graph, zero forcing, and related parameters. *Notices Amer. Math. Soc.*, 67:257–261, February, 2020.
1. L. Hogben, J. C.-H. Lin, and B. Shader. The inverse eigenvalue problem of a graph. In *50 Years of Combinatorics, Graph Theory, and Computing*, 1st edition, F. Chung, R. Graham, F. Hoffman, L. Hogben, R. C. Mullin, and D. B. West editors, CRC Press, Boca Raton, 2019.

PRESENTATIONS

Plenary Lectures

2017 "Variants of Zero Forcing," AIM Workshop: Zero forcing and its applications, San Jose, CA.

Invited for Special Sessions/Mini Symposia

2022 "Bifurcation lemma and its applications to the inverse eigenvalue problem," Annual Meeting of the Taiwan Mathematical Society, Hsinchu, Taiwan.

2023 "The bifurcation lemma for strong properties in the inverse eigenvalue problem of a graph," Joint Mathematics Meetings, Boston, MA.

2022 "Inverse eigenvalue problem of a graph," 05C50 Online Seminar, virtual.

2022 "Comparability and cocomparability bigraphs," 24th International Linear Algebra Society Conference, Galway, Ireland (LAA early career speaker).

2022 "Zero forcing: How to monitor an electricity network efficiently?," Eindhoven SPOR Seminar, Eindhoven, The Netherlands.

2022 "On the inverse eigenvalue problem for block graphs," Annual Meeting of the Taiwan Mathematical Society, Taipei, Taiwan.

2022 "On the inverse eigenvalue problem for block graphs," Joint Mathematics Meetings, Seattle, WA.

2021 "Zero forcing and eigenvalue multiplicities," Symposium for Young Combinatorists, New Taipei City, Taiwan.

2021 "The strong spectral property for graphs," SIAM Conference on Applied Linear Algebra with the embedded 23rd International Linear Algebra Society Conference, virtual.

2021 "The strong spectral property for graphs," Canadian Discrete and Algorithmic Mathematics Conference, virtual.

2021 "Zero forcing and its applications," Matrix Seminar at University of Nevada, Reno, virtual.

2021 "The strong spectral property for graphs," Joint Mathematics Meetings, virtual.

2020 "The strong spectral property for graphs," Annual Meeting of the Taiwan Mathematical Society, Taipei, Taiwan.

2019 "Zero forcing number, Grundy domination number and their variants," 22th International Linear Algebra Society Conference, Rio de Janeiro, Brazil.

2019 "Sign patterns requiring a unique inertia," 7th TWSIAM Annual Meeting, Hsinchu, Taiwan.

2018 "Comparability and cocomparability bigraphs," Annual Meeting of the Taiwan Mathematical Society, Taipei, Taiwan.

2018 "Sign patterns requiring a unique inertia," Colloquium at National Chiao Tung University, Hsinchu, Taiwan.

2018 "On the distance matrices of the CP graphs," Workshop on Combinatorics and Graph Theory, Taipei, Taiwan.

2018 "Graphs whose distance matrices have the same determinant," SIAM Conference on Discrete Mathematics, Denver, CO.

2018 "On the zero forcing process," Taiwan-Vietnam Workshop on Mathematics, Kaohsiung, Taiwan.

2018 "Zero forcing process and strong Arnold property," Discrete Mathematics Seminar at Simon Fraser University, Burnaby, BC, Canada.

2018 "Zero forcing and its applications," Science Seminar Series at Brandon University, Brandon, MB, Canada.

2018 "The inverse eigenvalue problem of a graph: Multiplicities and minors," Joint Mathematics Meetings, San Diego, CA.

2017 "General spectral graph theory: The inverse eigenvalue problem of a graph," Combinatorial Potlatch, Victoria, BC, Canada.

2017 "Note on von Neumann and Rényi entropies of a graph," 21th International Linear Algebra Society Conference, Ames, IA.

2016 "Distance Spectra of Graphs," AMS Fall Central Sectional Meeting, Minneapolis, MN.

2016 "Distance Spectra of Graphs," Symposium for Young Combinatorists, Taichung, Taiwan.

2016 "Using a new zero forcing process to guarantee the Strong Arnold Property," 20th International Linear Algebra Society Conference, Leuven, Belgium.

2016 "Using a new zero forcing process to guarantee the Strong Arnold Property," AMS Spring Central Sectional Meeting, Fargo, ND.

2016 "Odd cycle zero forcing parameters and the minimum rank problem," 47th Southeastern International Conference on Combinatorics, Graph Theory, and Computing, Boca Raton, FL.

2014 "Reduction identities of the minimum rank on loop graphs," 19th International Linear Algebra Society Conference (Satellite Conference of International Congress of Mathematicians 2014), Seoul, S. Korea.

Contributed

2017 "General spectral graph theory: The inverse eigenvalue problem of a graph," Annual Meeting of the Taiwan Mathematical Society, Taipei, Taiwan.

2017 "Note on von Neumann and Rényi entropies of a graph," Graduate Student Combinatorics Conference, Lawrence, KS.

2017 "The minimum rank problem on loop graphs," Joint Mathematics Meetings, Atlanta, GA.

2016 "Using a new zero forcing process to guarantee the Strong Arnold Property," Western Canada Linear Algebra Meeting, Winnipeg, MB, Canada.

2015 "Odd cycle zero forcing parameters and the minimum rank problem," Connections in Discrete Mathematics, Vancouver, BC, Canada.

2014 "The sieving process and lower bounds for the minimum rank problem," 45th Southeastern International Conference on Combinatorics, Graph Theory, and Computing, Boca Raton, FL.

2011 "Applications of zero forcing number to the minimum rank problem," Symposium for Young Combinatorists, Taipei, Taiwan.

2009 "Some combinatorial interpretations and applications of Fuss-Catalan numbers," Annual Meeting of the Taiwan Mathematical Society, Taiepei, Taiwan.

WORKSHOPS/PROGRAMS/CONFERENCES

2021 AMS Mathematics Research Communities on Finding Needles in Haystacks: Approaches to Inverse Problems using Combinatorics and Linear Algebra, virtual.

2021 52th Southeastern International Conference on Combinatorics, Graph Theory, and Computing, virtual.

2018 SIAM Conference on Applied Linear Algebra, Hong Kong.

2018 Algebraic Graph Theory & Quantum Walks, Waterloo, ON, Canada.

2018 Coast Combinatorics Conference, Victoria, BC, Canada.

2017 AMS Mathematics Research Communities on Beyond planarity: Crossing numbers of graphs, Snowbird Resort, UT.

2017 AIM Workshop: Zero forcing and its applications, San Jose, CA.

2016 BIRS Focused Research Group: The inverse eigenvalue problem of a graph, Banff, AB, Canada.

2016 Recent Advances in Linear Algebra and Graph Theory, Chattanooga, TN.

2016 Networked Life: Celebrating the life and career of Fan Chung and Ron Graham, San Diego, CA.

2015 Advanced Course on Combinatorial Matrix Theory, Barcelona, Spain.

2015 Graduate Research Workshop in Combinatorics (GRWC), Ames, IA.

2014 IMA Workshop: Geometric and enumerative combinatorics, Minneapolis, MN.

2014 IMA Workshop: Additive and analytic combinatorics, Minneapolis, MN.

2014 IMA Workshop: Probabilistic and extremal combinatorics, Minneapolis, MN.

2009 Summer Research Program on Combinatorics, Academia Sinica, Taiwan.

2004 Asian Pacific Mathematics Olympiad Training Camp, Taiwan.

TEACHING WORKSHOPS

2022 Certificate in EMI Skills (online training by Cambridge)

2020 Promoting EML in the University EML Environment (one-week workshop organised by British Council; with certification)

2020 Flipped Learning 3.0 Certification, Level - I

2017 Faculty Institute of Teaching Summer (one-week workshop organised by Learning and Teaching Centre at UVic)