

Xiaofeng Gu

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Appointments and education

- Since 2023 **Professor of Mathematics**, Department of Computing and Mathematics, UWG.
- 2020–2023 **Program Coordinator of Mathematics**,
Department of Computing and Mathematics, University of West Georgia
(formerly, Department of Mathematics, Sciences & Technology in 2020-2021).
- 2019–2023 **Associate Professor of Mathematics**, University of West Georgia.
- 2015–2019 **Assistant Professor**, Department of Mathematics, University of West Georgia.
- 2013–2015 **Assistant Professor**, Department of Mathematics and Computer Science,
University of Wisconsin-Superior, Superior, WI.
- 2012–2013 **Lecturer**, Department of Mathematics, Texas State University, San Marcos, TX.
- 2013 **Ph.D., Mathematics**, West Virginia University, Morgantown, WV.

External grants

- 2017-2022 **Spectral and combinatorial properties of graphs**, Collaboration Grants for
Mathematicians, Simons Foundation (\$42,000, **PI**), NCE to 2024.
- Fall 2012 **AMS Travel Grant**, American Mathematical Society.

Internal grants, honors and awards

- 2023-2024 **Professional Development Funds**, CACSI, University of West Georgia.
- 2019-2020 **College Faculty Research Grant**, COSM, University of West Georgia.
- 2017-2018 **Provost Fellow**, University of West Georgia.
- 2017-2018 **College Faculty Research Grant**, COSM, University of West Georgia.
- 2016-2017 **College Faculty Research Grant**, COSM, University of West Georgia.
- 2016 **Excellence in Research Award**, COSM, University of West Georgia.
- 2015-2016 **College Faculty Research Grant**, COSM, University of West Georgia.
- 2014-2015 **Faculty Development Grant**, University of Wisconsin-Superior.
- 2013-2014 **CETL Discipline Grant**, University of Wisconsin-Superior.
- Summer 2013 **The Summer Research Fellowship**, West Virginia University.
- 2012-2013 **Faculty of New Student Appreciation**, Texas State University.
- 2012 **HERF Award for excellent teaching assistant**, West Virginia University.
- Summer 2011 **The Summer Research Fellowship**, West Virginia University.

Research interests

My research lies in combinatorics and graph theory.

Publications

- [42] Spectral characterization of the complete graph removing a cycle
(with Muhuo Liu, Haiying Shan and Zoran Stanić),
Journal of Combinatorial Theory, Series A 205 (2024), 105868.
- [41] Cyclic base ordering of generalized Petersen graphs (with William Zhang),
Discrete Mathematics, Algorithms and Applications 16(2) (2024), 2350019.
(This is the journal version of the proceeding paper in **AAIM** 2022.)
- [40] Spectral radius and edge-disjoint spanning trees (with Dandan Fan and Huiqiu Lin),
Journal of Graph Theory 104 (2023), 697-711. (arXiv:2207.04701)
- [39] Graph rigidity properties of Ramanujan graphs
(with Sebastian M. Cioabă, Sean Dewar and Georg Grasegger),
The Electronic Journal of Combinatorics 30(3) (2023), #P3.12.
(arXiv:2206.03983)
- [38] Spanning tree packing and 2-essential edge-connectivity
(with Runrun Liu and Gexin Yu),
Discrete Mathematics 346 (2023), 113132. (arXiv:2208.12922)
- [37] Cyclically orderable generalized Petersen graphs (with William Zhang),
Proceedings of the 16th International Conference on Algorithmic Aspects in Information and Management (**AAIM** 2022), **Lecture Notes in Computer Science** 13513 (2022), 303-315.
- [36] ℓ -Connectivity and ℓ -edge-connectivity of random graphs
(with Ran Gu, Yongtang Shi and Hua Wang),
Journal of Graph Theory 101 (2022), 5-28.
- [35] On hamiltonian line graphs of hypergraphs (with Hong-Jian Lai and Sulin Song),
Journal of Graph Theory 100 (2022) no. 3, 489-503.
- [34] Graph toughness from Laplacian eigenvalues (with Willem H. Haemers),
Algebraic Combinatorics, Volume 5 (2022) no. 1, pp. 53-61. (arXiv:2104.03845)
- [33] Extremal augmented Zagreb index of trees with given numbers of vertices and leaves
(with Chaohui Chen, Muhuo Liu, and Kinkar Chandra Das),
Discrete Mathematics 345-4 (2022), 112753.
- [32] Spectral strengthening of a theorem on transversal critical graphs (with Muhuo Liu),
Discrete Mathematics 345-3 (2022), 112717. (arXiv:2008.07474)
- [31] A tight lower bound on matching number of graphs via Laplacian eigenvalues
(with Muhuo Liu), **European Journal of Combinatorics** 101 (2022), 103468.
(arXiv:2103.11550)
- [30] Sufficient conditions for 2-dimensional global rigidity
(with Wei Meng, Martin Rolek, Yue Wang and Gexin Yu),
SIAM Journal on Discrete Mathematics 35-4 (2021), 2520-2534.
(arXiv:2106.08539)
- [29] Spectral conditions for graph rigidity in the Euclidean plane
(with Sebastian M. Cioabă and Sean Dewar),
Discrete Mathematics 344 (2021), 112527. (arXiv:2001.06934)

- [28] A proof of Brouwer's toughness conjecture,
SIAM Journal on Discrete Mathematics 35-2 (2021), 948-952.
(arXiv:2010.05065)
- [27] Spectral characterization of the complete graph removing a path:
Completing the proof of Cámara-Haemers Conjecture (with Muhuo Liu),
Discrete Mathematics 334 (2021), 112275.
- [26] Toughness in pseudo-random graphs,
European Journal of Combinatorics 92 (2021), 103255.
- [25] Spectral characterization of the complete graph removing a path (with Muhuo Liu
and Haiying Shan), **Discrete Applied Mathematics** 284 (2020), 499-512.
- [24] Spanning bipartite graphs with high degree sum in graphs
(with G. Chen, S. Chiba, R. Gould, A. Saito, M. Tsugaki and T. Yamashita),
Discrete Mathematics 343 (2020), 111663.
- [23] Unified extremal results for vertex-degree-based graph invariants with given diameter
(with Muhuo Liu and Yuedan Yao), **MATCH Communications in Mathematical
and in Computer Chemistry** 82 (2019), 699-714.
- [22] Spanning rigid subgraph packing and sparse subgraph covering,
SIAM Journal on Discrete Mathematics 32 (2018), 1305-1313.
- [21] Cycles with a chord in dense graphs (with G. Chen, R. Gould and A. Saito),
Discrete Mathematics 341 (2018), 2131-2141.
- [20] A property on reinforcing edge-disjoint spanning hypertrees in uniform hypergraphs
(with H.-J. Lai), **Discrete Mathematics** 341 (2018), 400-404.
- [19] Spectrum bounds for the scattering number, integrity, tenacity of regular graphs
(with Yinkui Li and Yongtang Shi), **Future Generation Computer Systems** 83
(2018), 450-453.
- [18] Packing spanning trees and spanning 2-connected k -edge-connected essentially
 $(2k - 1)$ -edge-connected subgraphs, **Journal of Combinatorial Optimization** 33
(2017), 924-933.
- [17] Connectivity, toughness, spanning trees of bounded degree, and the spectrum of
regular graphs (with S.M. Cioabă), **Czechoslovak Mathematical Journal** 66
(2016), 913-924 (special issue dedicated to Professor Miroslav Fiedler).
- [16] Fractional spanning tree packing, forest covering and eigenvalues (with Y. Hong,
H.-J. Lai and Q. Liu), **Discrete Applied Mathematics** 213 (2016) 219-223.
- [15] Spectral conditions for edge connectivity and packing spanning trees in multigraphs,
Linear Algebra and its Applications 493 (2016), 82-90.
- [14] Edge-disjoint spanning trees, edge connectivity and eigenvalues in graphs
(with H.-J. Lai, P. Li and S. Yao), **Journal of Graph Theory** 81(2016), 16-29.
(JGT Most Cited Top 3 Papers in 2015-2016)
- [13] Augmenting and preserving partition connectivity of a hypergraph (with H.-J. Lai),
Journal of Combinatorics 5 (2014), 271-289.

- [12] Regular factors and eigenvalues of regular graphs,
European Journal of Combinatorics 42 (2014), 15-25.
- [11] Note on edge-disjoint spanning trees and eigenvalues
(with Q. Liu, Y. Hong and H.-J. Lai),
Linear Algebra and its Applications 458 (2014), 128-133.
- [10] Characterizations of strength extremal graphs (with H.-J. Lai, P. Li and S. Yao),
Graphs and Combinatorics 30 (2014), 1453-1461.
- [9] Cyclic base orderings in some classes of graphs (with K. Horacek and H.-J. Lai),
Journal of Combinatorial Mathematics and Combinatorial Computing 88
(2014), 39-50.
- [8] Realizing degree sequences with k -edge-connected uniform hypergraphs
(with H.-J. Lai), **Discrete Mathematics** 313 (2013), 1394-1400.
- [7] Improved algorithms for optimal length resolution refutation in difference constraint
systems (with K. Subramani and M. Williamson),
Formal Aspects of Computing 25 (2013), 319-341.
- [6] Multigraphic degree sequences and supereulerian graphs, disjoint spanning trees
(with H.-J. Lai and Y. Liang),
Applied Mathematics Letters 25 (2012), 1426-1429.
- [5] Characterization of minimally $(2, l)$ -connected graphs (with H.-J. Lai and S. Yao),
Information Processing Letters 111 (2011), 1124-1129.
- [4] Absorbing random walks and the NAE2SAT problem (with K. Subramani),
International Journal of Computer Mathematics 88 (2011), 452-467.
- [3] Group connectivity in products of graphs (with J. Yan, S. Yao and H.-J. Lai),
International Journal of Algebra 4 (2010), 1185-1200.
- [2] Random walks for selected Boolean implication and equivalence problems
(with K. Subramani and H.-J. Lai), **Acta Informatica** 46 (2009), 155-168.
- [1] Improved algorithm for detecting negative cost cycles in undirected graphs
(with K. Madduri, K. Subramani and H.-J. Lai),
Proceedings of the Third Annual International Frontiers of Algorithmics Workshop
(FAW), **Lecture Notes in Computer Science** 5598 (2009), 40-50.

Conferences organized

- October 2020 Special Session on Advances in Graph Theory, AMS Fall Southeastern Sectional Meeting #1161, Virtual meeting (formerly at University of Tennessee at Chattanooga, TN), October 10-11, 2020
https://www.ams.org/meetings/sectional/2281_program_ss5.html
- March 2019 Special Session on Recent Developments in Graph Theory, AMS Spring Southeastern Sectional Meeting #1146, Auburn University, Auburn, AL, March 15-17, 2019
https://www.ams.org/meetings/sectional/2261_program_ss16.html
- April 2018 The 59th Midwest Graph Theory Conference (**MIGHTY**), West Virginia University, Morgantown, WV, April 28, 2018.

- October 2017 The 31st Midwestern Conference on Combinatorics and Combinatorial Computing (**MCCCC**), University of West Georgia, Carrollton, GA, October 20-22, 2017
<https://sites.google.com/a/westga.edu/mcccc31/>
- January 2017 AMS Special Session on Topics in Graph Theory, 2017 Joint Mathematics Meetings, Atlanta, GA, January 6, 2017
- October 2015 Special Session on Recent Developments in Graph and Matroid Theory, AMS Central Fall Sectional Meeting #1112, Loyola University Chicago, Chicago, IL, October 3-4, 2015. http://www.ams.org/meetings/sectional/2219_program_ss23.html
- October 2014 International Workshop on Combinatorial Algorithms (**IWOCA**), Duluth, MN October 15-17, 2014
- September 2014 Special Session on Graph and Hypergraph Theory, AMS Central Fall Sectional Meeting #1102, University of Wisconsin-Eau Claire, Eau Claire, WI, September 20-21, 2014. http://www.ams.org/meetings/sectional/2212_program_ss7.html

Editor, reviewer and referee

- 2022–present Associate Editor of **Discrete Mathematics, Algorithms and Applications**
- 2015 Technical Editor of **Combinatorial Algorithms**, Lecture Notes in Computer Science, Volume 8986
- 2013–present Reviewer for **MathSciNet** Mathematical Reviews (**MR**)
- 2021 Reviewer for **Simons Foundation** Collaboration Grants for Mathematicians
- Referee: Advances in Mathematics (China), Applied Mathematics and Computation (**AMC**), Discrete Applied Mathematics (**DAM**), Discrete Mathematics (**DM**), Electronic Journal of Combinatorics (**EJC**), Electronic Journal of Linear Algebra (**ELA**), European Journal of Combinatorics (**YEUJC**), Graphs and Combinatorics (**GCOM**), IEEE Transactions on Knowledge and Data Engineering (**TKDE**), Journal of Algebraic Combinatorics (**JACO**), Journal of Combinatorial Mathematics and Combinatorial Computing (**JCMCC**), Journal of Combinatorial Theory Series B (**JCTB**), Journal of Combinatorics (**JOC**), Journal of Graph Theory (**JGT**), Journal of Inequalities and Applications (**JIA**), Linear algebra and its Applications (**LAA**), Linear and Multilinear Algebra (**LAMA**), Miskolc Mathematical Notes (**MMN**), SIAM Journal on Discrete Mathematics (**SIDMA**)

Courses taught

University of West Georgia, Carrollton, GA (2015-present)

- Math 6663 (Problem Solving II: Geometry & Graphs), online; graduate level
- Math 6473 (Combinatorial Analysis), graduate level
- Math 4483 & 5483 (Graph Theory), undergraduate and graduate crosslisted
- Math 4473 (Combinatorics)
- Math 4043 & 5043 (Number Theory), undergraduate and graduate crosslisted
- Math 3003 (Transition to Advanced Math)
- Math 2853 (Elementary Linear Algebra)
- Math 1634 (Calculus I)
- Math 1413 (Survey of Calculus)
- Math 1113 (Precalculus)

Math 1112 (Trigonometry & Analytic Geometry)
Math 1111 (College Algebra)
XIDS 2002 (The Mathematics Behind Voting), First Year Seminar
[University of Wisconsin-Superior, Superior, WI \(2013-2015\)](#)
Math/CS 437 (Cryptography)
Math/CS 320 (Discrete Structure)
Math 242 (Calculus and Analytic Geometry III)
Math 241 (Calculus and Analytic Geometry II)
Math 112 (Introduction to Contemporary Mathematics)
[Texas State University, San Marcos, TX \(2012-2013\)](#)
Math 2471 (Calculus I)
Math 2417 (Precalculus)
Math 2321 (Calculus for Life Sciences I)
Math 1315 (College Algebra)
[West Virginia University, Morgantown, WV \(2010-2012\)](#)
Math 261 (Elementary Differential Equations)
Math 156 (Calculus II)
Math 155 (Calculus I for engineering)

Advising student research

Summer 2022 **Project:** A project on cyclic ordering of some families of graphs (arXiv:2211.09654)
2021-2022 **Project:** Cyclic base ordering of generalized Petersen graphs (published: Discrete Mathematics, Algorithms and Applications 16(2) (2024), 2350019.)
Summer 2021 **Project:** Cyclic base ordering of graphs (arXiv:2110.00892)
2017-2018 **Project:** Enumerating degree sequences of k -edge-connected graphs/hypergraphs
Spring 2015 **Capstone project:** Computing edge-disjoint spanning trees from eigenvalues

Recent committees and representatives

USG and university level

2021-present Regents' Advisory Committee (**RAC**): Mathematical Subjects (ACMS)

College level

Spring 2023 Math representative of the CACSI Academic Showcase, February 4, 2023

Department and program level

2023-2024 Undergraduate Curriculum Committee

2023-2024 Promotion and Tenure Committee (**Chair**)

Professional membership

American Mathematical Society (**AMS**)