Mohammad A. Abudayah

CONTACT INFORMATION

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RESEARCH INTERESTS

Discrete Mathematics, Graph Theory, Algebraic Graph Theory, Matrix Analysis and Abstract Algebra.

EDUCATION

The University of Jordan

Ph.D. in Mathematics 2010

- Dissertation: "Further Properties of Hurwitz Series Ring "
- Dissertation Topic: Algebra.
- Advisor: Hasan El-Azeh

M.Sc. in Mathematics, 2004

- Dissertation: "Combinatorial Methods in Continued Fractions"
- Dissertation Topic: Combinatorics.
- Advisor: Shaker Nazzal

Yarmouk University

B.A., Mathematics, 1999

ACADEMIC EXPERIENCE

Associate Professor, German Jordanian University, Amman Jordan.	**2019 - To date**
Assistant Professor, German Jordanian University, Amman Jordan.	**2014 - 2019**
Full Time Lecturer, German Jordanian University, Amman Jordan.	**2012 - 2014**
Lecturer, Prince Sumaya University, Amman Jordan.	**2010 - 2011**
Lecturer, University of Jordan, Amman Jordan.	**2008 - 2009**
Full time-Instructor, King Hussein Foundation, Amman Jordan.	**2001 - 2012**

WORK EXPERIENCE

- Dean, School of Basic Siences and Humanities, 2022- To date.
- Vice Dean, School of Basic Siences and Humanities, 2019-2022.
- The Scientific Research Committee, School of Basic Sciences and Humanities. 2017-2022.
- The Scientific Research Council, German Jordanian University. 2018-2021.

RESEARCH ACTIVITIES

- Siminar, On the Inverse of $\alpha-$ Hermitian Adjacency Matrix of Mixed Graphs . University of Lepzig, Germany, Sep. 2022.
- Siminar, On the Non-Negative Spectrum of Digraphs. University of Lepzig, Germany, Feb. 2022.
- Siminar, Spectrum of Sudoku Graphs. Ostfalia Hochschule, Fakultät Informatik, Germany, Sep. 2018
- Siminar, On the Non-Negative Spectrum of Mixed Graphs. Ostfalia Hochschule, Fakultät Informatik, Germany, Sep. 2018.

RESEARCH PROJECTS

1. PI-investigator: Seed Project at German Jordanian University. Mohammad Abudayah and Omar Alomari: Hermitian Adjacency Matrices of Mixed Graphs. (2020)
2. Co-investigator: Seed Project at German Jordanian University. Thelal Oweis, Kawthar Karaen and Mohammad Abudayah: Perceptions and Expectations of Students Regarding the Evaluation System vs. the Existing Reality. (2020)
3. PI-investigator: Seed Project at German Jordanian University. Mohammad Abudayah and Torsten Sander: Eigenspace of Integral Cayley Graph over an Abelian Group.(2017)
4. Co-Investigator: Seed Project at German Jordanian University. Omar Alomari, Mohammad Abudayah and Sahel Alouneh: Sc-graph on the computer network.(2017)

ACADEMIC AWARDS

- Erasmus Staff Mobility: Lectures and Siminars on interplay between graph theory, Algebra and Automata Theory.
- Invited Lecturer, funded by The Ostfalia Hochschule and the German Academic Exchange Service (DAAD), @ Fakultät Informatik, Germany, Aug. 2017-Sep 2017.
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PUBLICATIONS

1. Mohammad Abudayah, Omar Alomari and Torsten Sander. "Incidence matrices and line graphs of mixed graphs", Special Matrices, (Accepted).
2. Mohammad Abudayah, Omar Alomari and Omar AbuGhneim, "Inverse of Hermitian Adjacency Matrix of a Mixed Graph", Applied Mathematics and Information Sciences Vol. 16, No. 5 (Sep. 2022), PP:823-828.
3. Omar Alomari, Mohammad Abudayah, Manal Ghanem, "On the Cospectrality of Hermitian Adjacency Matrices of Mixed Graphs", European Journal of Pure and Applied Mathematics: Vol. 15 No. 3, (Sep. 2022) PP:1090-1097.
4. Mohammad Ali Abudayah, Omar Alomari, Torsten Sander, "Hermitian Adjacency Matrices of Mixed Graphs" , European Journal of Pure and Applied Mathematics: Vol. 15 No. 3: (July 2022).
5. Raed Mesleh, Mohammad Abudayah, and Omar Hiari, "Novel Space Shift Keying MIMO Technique Based On a Steiner Triple System", Journal of the Franklin Institute: Vol. 359, Issue 16:(Sep 2022) pp. 486-495.
6. Abudayah, Mohammad, Alomari, Omar and Sander, Torsten. "On the N-spectrum of oriented graphs" Open Mathematics, vol. 18, no. 1, (2020), pp. 486-495. https://doi.org/10.1515/math-2020-0167.
7. Alomari, Omar, Abudayah, Mohammad and Sander, Torsten. "The non-negative spectrum of a digraph" Open Mathematics, vol. 18, no. 1, (2020), pp. 22-35. https://doi.org/10.1515/math-2020-0005.
8. Hawawsheh, Laith and Abudayah, Mohammad. A boundedness result for Marcinkiewicz integral operator, Open Mathematics, vol. 18, no. 1, (2020), pp. 829-836. https://doi.org/10.1515/math-2020-0046.
9. Laith, H., A. Mohammad, and H. Dutta. A New Class of Special Functions in Higher Dimensions. Miskolc Mathematical Notes (2020), pp. 953-958.
10. Mohammad Abudayah, Omar Alomari. 2019. Semi square stable graphs. Mathematics (2019), 7, 597; doi:10.3390/math7070597
11. Eman AbuHijleh, Mohammad Abudayah , Omar Alomari and Hassan Al Ezeh. Matching Number, Independence Number, and Covering Vertix Number OF $G(Z_n)$. MATHEMATICS (2019) 7(1) 49 https://doi.org/10.3390/math7010049.

12. Mohammad Abudayah, Omar Alomari and Torsten Sander. 2018. Spectrum of Free Form Sudoku Graph. Open Mathematics (2018) https://doi.org/10.1515/math-2018-0125.
13. Mohammad Abudayah , Omar Alomari and Hassan Al Ezeh . 2018. Geodetic Number of Powers of Cycles. Symmetry 10 (2018) 592.
14. Emad Jaradat, Omar Al-Omari,Mohammad Abudayah and Ala'a Al-Faqih. An Approximate Analytical Solution of the Nonlinear Schrodinger Equation with Harmonic Oscillator Using Homotopy Perturbation Method and Laplace-Adomian Decomposition Method. Advances in Mathematical Physics. (2018) https://doi.org/10.1155/2018/6765021
15. Riad Ababneh, Ahmad Telfah, Inshad Jum'h, Mohammad Abudayah, Yousef Al-Abdallat, Jörg Lambert and Roland Hergenröder . 1H NMR spectroscopy to investigate the kinetics and the mechanism of proton charge carriers ionization and transportation in hydrophilic/hydrophobic media: Methyl sulfonic acid as a protonic ion source in water/alcohol binary mixtures. Journal of Molecular Liquids. 265 (2018) 621-628.
16. Omar Alomari, Mohammad Abudayah and Torsten Sander . Integral Free-Form Sudoku graphs. Electronic Notes in Discrete Mathematics 68 (2018) 47-52.
17. Mohammad Abudayah , Omar Alomari and Hasan Al-Ezeh. Square Complementary Stable Graphs, Congressus Numerantium (2017).
18. Mohammad Abudayah and Hasan Al-Ezeh. Unitary Cayley Graphs over Ring of Dual Numbers, Journal of Combinatorial Mathematics and Combinatorial Computing 101 (2017) 73-81.
19. Omar Alomari, Mohammad Abudayah and Hasan Al-Ezeh. Regular cubeco graphs. Global Journal of Pure and Applied Mathematics (GJPAM). 12, 2 (2016) 1663-1669.
20. Omar Alomari, Mohammad Abudayah and Hasan Al-Ezeh. Graphs whose complement and cube are isomorphic, Journal of Combinatorial Mathematics and Combinatorial Computing. 94 (2015) 261-271.

Submitted Papers

1. Mohammad Abudayah, Omar Alomari and Manal Ghanem. The γ-Signless Laplacian Adjacency Matrix of Mixed Graphs.
2. Mohammad Abudayah, Omar Alomari and Omar AbuGhneim. Inverse of γ-Hermitian Adjacency Matrix of Bipartite Graphs.
3. Mohammad Abudayah, Omar Alomari and Omar AbuGhneim. Inverse of γ-Hermitian Adjacency Matrix of a Unicyclic Bipartite Graph.

Conference Presentations and Proceedings

1. Raed Mesleh, Omar Hiari and Mohammad Abudayah, "Massive MIMO With Few Number of Transmit Antennas: Space Shift Keying–Steiner Triple System", 2022 International Conference on Engineering and Emerging Technology (ICEET), 2022 (Accepted).
2. R. Mesleh, M. Abudayah, O. Hiari and A. Younis, "A Secure MIMO Wireless Communication Systems Based on Hamiltonian Graphs and Artificial Noise," 2022 IEEE 2nd International Maghreb Meeting of the Conference on Sciences and Techniques of Automatic Control and Computer Engineering (MI-STA), 2022, pp. 385-389, doi: 10.1109/MI-STA54861.2022.9837678.
3. Mohammad Abudayah, Omar Alomari. On The Cospectrality of Hermitian Adjacency Matrices of Mixed Graphs. The 11th International Colloquium on Graph Theory and combinatorics. France.
4. Mohammad Abudayah, Omar Alomari. Inverse of i-Hermitian Adjacency matrices of mixed Trees, 2020. 52th Southeastern International Conference on Combinatorics, Graph Theory and Computing. USA.
5. Mohammad Abudayah, Omar Alomari and Torsten Sander. On the N-spectrum of oriented graphs, 2019. The Gdańsk Workshop on Graph Theory (GWGT), Poland.

6. Mohammad Abudayah, Omar Alomari and Torsten Sander. Integral Free-Form Sudoku graphs. 2018. Discrete Mathematics Days 2018. Sevilla, Spain, Jun 2018.
7. Mohammad Abudayah, Omar Alomari and Hasan Al-Ezeh. Square Complementary Stable Graphs . 2017. 48th Southeastern International Conference on Combinatorics, Graph Theory and Computing. Florida, March 2017.
8. Omar Alomari, Mohammad Abudayah and Hasan Al-Ezeh. 2015. Semi Square Stable Graphs. Lebanese International Conference on Mathematics and Applications. Lebanon, May, 2015.

PhD. Supervisor

1. Wafa Bolhmar, The University of Jordan. On the Inverse of Hermitian Adjacency Matrices of the Unit Gain graphs.
2. Yusra Qasem, The University of Jordan. Constructions of Some Classes of Balanced Incomplete Block Design.

Referee Work

1. Discrete Mathematics.
2. TWMS Journal of Applied and Engineering Mathematics.
3. The Jordanian Journal of Mathematics and Statistics
4. Mathematics
5. Open Mathematics.
6. Italian Journal of Pure and Applied Mathematics

PhD.External Examinar

1. Some Graphs Whose Maximal Clique have the Same Cardinality, Baha Mohammad Abughazaleh. University of Jordan.
2. Properties of 2-Good Rings and Their Generaliztions, Shatha Ismail Al Aqtash. University of Jordan.
3. Generalization of S-Prime Ideals, Wala'a Kasasbeh. University of Jordan.

International and National Collaboration

- The University of Jordan.
- Mutah University.
- Jordan Design and Development Bureau.
- University of Ostfalia - Germany.
- University of Leipzig - Germany.
- University of Florida - USA.
- Expert Contributor to the Intergovernmental special committee meeting to the draft UNESCO Recommendation on Open Science.