Fatemeh Koorepazan-Moftakhar

Personal details

Homepage Github

E-mail f.k.moftakhar@gmail.com

fatemeh.moftakhar@fmph.uniba.sk

Address Faculty of Mathematics, Physics, and Computer Science, Comenius University, Bratislava, Slovakia

Tel +421 951 881 427

Employment

04/2022-present **Postdoctoral Researcher**.
Comenius University, Slovakia

01/2022-03/2022 **Visiting Researcher**.
Comenius University, Slovakia

03/2021-03/2022 **Scientific Researcher**.
Panoptopia, Iran

01/2018-02/2022 **University Lecturer**.
Islamic Azad University, Science and Research Branch, Iran

07/2019-06/2020 **Postdoctoral Researcher**.
Sharif University of Technology, Iran

01/2016-12/2020 **Managing Editor of Mathematics Interdisciplinary Research**.
University of Kashan, Iran

09/2013-09/2018 **Ph.D. Fellow**.
University of Kashan, Iran

Education

2013-2018 **Ph.D. in Mathematics**, University of Kashan.
Thesis: *The Supercharacter Theories of a Finite Group and the Structure of Their Associated Normal Subgroups*
Advisors: Prof. Ali Reza Ashrafi, Prof. Mohammad Reza Darafsheh

2010-2013 **M.Sc. in Mathematics**, University of Kashan.
Thesis: *Counting Assembly Pathway by Using Permutation Group Action*
Prof. Ali Reza Ashrafi, Dr. Mohammad Javad Najafi-Arani

Awards

2022 Full Grant Award of GAP Days Summer 2022, Germany

2022 Full Grant Award of CIMPA, France

2022 Travel Grant Award of AUF, Lebanon

2021 Travel Grant Award of 8EMC, Slovenia

2020 Winner of the Shahid Tehrani Moghadam Award by the Iran's National Elites Foundation, Iran

2019 Winner of the Shahid Chamran Grant by the Iran's National Elites Foundation to be a Post-Doctoral Researcher at Sharif University of Technology, Iran

2018 Outstanding Student Award, Iran

2018 First rank in PhD (GPA 19.75 out of 20)

2018 Travel Grant Award of ISCD summer school, France

2018 Distinguished Ph.D. Student Award, Iran

2017 Visiting Research Fund, Ministry of Science and Technology, Iran

2016 Travel Grant Award of 7EMC, Germany

2014 Distinguished Ph.D. Researcher Award, Iran

2013 Third rank in M.Sc.

2013 Distinguished M.Sc. Researcher Award, Iran

2013 Best Logo Award in ERICE 58^{th} Workshop: CARBON TOPOLOGY, Italy

Research interests

- Computational Graph Theory, Computational Group Theory
- Machine Learning (Graph Neural Networks and Knowledge Graph): Design, build, and deploy machine learning algorithms to solve real-world and theoretical problems

Publications

All papers are available on Google Scholar
Note: In my domain, the authors of an article are typically listed in alphabetical order.

Selected journal articles

- S. Akbari, K.C. Das, S. Ghezelahmad, F. Koorepazan–Moftakhar, Hypoenergetic and nonhypoenergetic digraphs, *Linear Algebra Appl.* **618** (2021) 129–143.
- S. Akbari, K.C. Das, M. Ghahremani, F. Koorepazan-Moftakhar, E. Raoufi, Energy of graphs containing disjoint cycles, *MATCH Commun. Math. Comput. Chem.* **86**(3) (2021) 543–547.
- A.R. Ashrafi, L. Ghanbari, K. Kavousi, F. Koorepazan-Moftakhar, An algorithm for constructing all supercharacter theories of a finite group, *Ars Math. Contemp.* **18** (2020) 149–162.
- A.R. Ashrafi, F. Koorepazan-Moftakhar, M.A. Salahshour, Counting the number of centralizers of 2-element subsets in a finite group, *Comm. Algebra* **48**(11) (2020) 4647–4662.
- S. Akbari, M. Ghahremani, I. Gutman, F. Koorepazan-Moftakhar, Orderenergetic graphs, *MATCH Commun. Math. Comput. Chem.* **84** (2020) 325–334.
- A. Aashtab, S. Akbari, E. Ghasemian, A.H. Ghodrati, M.A. Hosseinzadeh, F. Koorepazan-Moftakhar, On the minimum energy of regular graphs, *Linear Algebra Appl.*, **581**(15) 51–71 (2019).
- A.R. Ashrafi, F. Koorepazan-Moftakhar, Counting the number of supercharacter theories of a finite group, *C. R. Math. Acad. Sci. Paris* **357** (2019) 323–326.
- A.R. Ashrafi, F. Kooperazan–Moftakhar, On normal graph of a finite group, *Filomat* **32**(11) (2018) 4047–4059.
- F. Kooperazan–Moftakhar, A.R. Ashrafi, Note on symmetry of molecules, *MATCH Commun.*

Math. Comput. Chem. **78** (2017) 273–279.

- F. Koorepazan–Moftakhar, A.R. Ashrafi, Combination of distance and symmetry in some molecular graphs, *Appl. Math. Comput.* **281**(30) (2016) 223-232.
- F. Koorepazan–Moftakhar, A.R. Ashrafi, Distance under symmetry, *MATCH Commun. Math. Comput. Chem.* **74** (2015) 259–272.

Book

(Translation to Persian) Algebraic Models of Accounting Systems, Arnika, 2022.

Book chapters

- F. Koorepazan-Moftakhar, A. R. Ashrafi, O. Ori and M. V. Putz, Atlas of ρ, ρ^E and $TM - EC$ for Fullerenes Isomers, In: Sustainable Nanosystems Development, Properties, and Applications, M. V. Putz(Ed.) IGI-Global, 2017, pp. 615–656.
- M. Faghani, G. Y. Katona, A. R. Ashrafi and F. Koorepazan- Moftakhar, A Lower Bound for Graph Energy of Fullerenes, In: Distance, Symmetry, and Topology in Carbon Nanomaterials, A. R. Ashrafi and M. V. Diudea (Eds.), Springer Verlag, London, 2016, Chapter 26, pp. 463-471.
- M. V. Diudea, A. Parvan-Moldovan, F. Koorepazan-Moftakhar and A. R. Ashrafi, Topological Symmetry of Multi-Shell Clusters, In: Distance, Symmetry, and Topology in Carbon Nanomaterials, A. R. Ashrafi and M. V. Diudea (Eds.), Springer Verlag, London, 2016, Chapter 5, pp. 61-82.
- A. R. Ashrafi, F. Koorepazan-Moftakhar and M. V. Diudea, Distance under Symmetry: $(3, 6)$ −Fullerenes, In: Distance, Symmetry, and Topology in Carbon Nanomaterials, A. R. Ashrafi and M. V. Diudea (Eds.), Springer Verlag, London, 2016, Chapter 4, pp. 51-60.
- F. Koorepazan-Moftakhar and A. R. Ashrafi, An Algebraic Modification of Wiener and Hyper-Wiener Indices and their Calculations for Fullerenes, In: Distance, Symmetry, and Topology in Carbon Nanomaterials, A. R. Ashrafi and M. V. Diudea (Eds.), Springer Verlag, London, 2016, Chapter 3, pp. 33-50.
- A. R. Ashrafi, F. Koorepazan–Moftakhar and O. Ori, Symmetry and Topology of Graphenes, In: Handbook of Graphene Science, Z. A. Niknam (Ed.), CRC Press, 2016, Chapter 10, pp. 159–164.
- F. Koorepazan–Moftakhar, A. R. Ashrafi and O. Ori, Geometry and Topology of Nanotubes and Nanotori, In: Exotic Properties of Carbon Nanomatter: Advances in Physics and Chemistry, M. V. Putz and O. Ori (Eds.), Springer Verlag, London, 2015, Chapter 6, pp. 131–152.
- F. Koorepazan-Moftakhar, A. R. Ashrafi, O. Ori and M. V. Putz, Sphericality of Some Classes of Fullerenes Measured by Topology, In: Fullerenes: Chemistry, Natural Sources and Technological Applications, Sh. B. Ellis (Ed.), Nova Science Publishers, 2014, 285–304.

Completed research project

- January 2022 - March 2023: Extermal Locally Uniform Combinatorial Structures (Postdoctoral researcher at Comenius University)
- July 2019 - June 2020: Generalization of Signless Laplacian Matrices and Their Applications in Complex Networks (Postdoctoral researcher at Sharif University of Technology)
- September 2013 - August 2018: The Supercharacter Theories of a Finite Group and the Structure of Their Associated Normal Subgroups (Ph.D. Thesis)
- April 2017 - January 2019: Relationship between Stability and Structure Invaraiants of Fullerens and Nanotubes (with A.R. Ashrafi)
- October 2015 - February 2017: Effect of Topology and Symmetry on Nanostructures (with A.R. Ashrafi)

- June 2014 - February 2015: Distanced-Symmetry Based Indices of Fullerenes, Nanotubes, Nanocones and Noanstars (with A.R. Ashrafi)
- July 2013 - April 2014: Symmetry Groups of Nanotubes and Nanotori (with A.R. Ashrafi)
- July 2012 - October 2014: Using of Polya Counting Theorem and Cycle Index Polynomial of a Finite Group (with A.R. Ashrafi, H. Shabani, E. Haghi, A. Tadayon-Far, H. Khodashenas, M. Hakimi-Nezhad)
- September 2010 - August 2013: Counting Assembly Pathway by Using Permutation Group Action (Master Thesis)

Talks on conferences

- An algorithm for constructing all supercharacter theories of a finite group, GAP Days Summer 2022, Aachen, Germany, October 17-21, 2022.
- Constructions of Small Regular Graphs of Given Degree and Girth Using Voltage Lift Graphs and Computer Searches, 22^{nd} Conference ITAT, Slovakia, September 24, 2022.
- Some bounds on the energy of graphs, Graph Theory and Interactions, Beirut, Lebanon, June 6-14, 2022.
- A Brief Introduction to SageMath, Algebraic Graph Theory Seminar, Comenius University, Bratislava, Slovakia, April 29, 2022.
- Algebraic Models for Accounting Systems, Algebraic Graph Theory Seminar, Comenius University, Bratislava, Slovakia, March 4, 2022.
- Constructing Supercharacter Theories of Finite Groups, 48^{th} Annual Iranian Mathematics Conference, Hamedan, Iran, August 22-25, 2017.
- Symmetry of Cubic Graphs, International Conference Bio-Nano-Math-Chem, Cluj, Romania, June 29, 2017.
- Towards the Classification of Finite Simple Groups with exactly Three or Four Supercharacter Theories, 47^{th} Annual Iranian Mathematics Conference, Karaj, Iran, August 28-31, 2016.

Teaching

Instructor	Calculus, Python Programming, Linear Algebra, Discrete Structure
Teacher Assistant	Calculus, Algebra I, Linear Algebra, Complex Functions, Differential Equations

Honorary activities

- Reviewer of the American Mathematical Reviews
- Contributed on writing a book on graph theory with Prof. S. Akbari

Membership in scientific society

2014-2018	Member of European Society of Mathematical Chemistry (ESMC)
2015-2019	Iranian Mathematical Society

Skills

Software	GAP, Sage, LaTex, GeoGebra, NewGraph, Maple, MAGMA, Microsoft Office, HyperChem, TopoCluj, ChemDraw, Nanotube Modeler

Language Programming	Python (Pandas, Numpy, Scikit-learn)
Knowledge of	Machine Learning, Graph Neural Network, Knowledge Graph

Language skills

Persian	Native language
English	Professional working proficiency
German	Basic

References

- **Prof. Ali Reza Ashrafi**, Department of Pure Mathematics, University of Kashan, Iran, ashrafi@kashanu.ac.ir
- **Prof. Ivan Gutman**, Faculty of Science, University of Kragujevac, Serbia, gutman@kg.ac.rs
- **Prof. Wilfried Imrich**, Department für Mathematik und Informationstechnologie of Montanuniversität Leoben, Austria, imrich@unileoben.ac.at
- **Prof. Saieed Akbari**, Department of Mathematical Sciences, Sharif University of Technology, Iran, s_akbari@sharif.edu
- **Prof. Robert Jajcay**, Faculty of Mathematics, Physics, and Computer Science, Comenius University, Slovakia, robert.jajcay@fmph.uniba.sk