Usman Ali
Professor of Mathematics

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📅 March 15, 1976

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◉ Multan, Pakistan

Why *Usman?*

- Effective in overseeing academic operations, including faculty management and curriculum planning
- Conscientious and proficient mathematician possesses strong grasp on mathematical research principles and their practical implementations
- Earnest individual capable of articulating multiple tasks and seasoned at collecting, organizing & analyzing information to design researches; has ability to contribute in development through research & teaching of international excellence

CORE STRENGTHS & ENABLING SKILLS

- Low-Dimensional Topology
- Graph Theory
- Metroid Theory

- Reporting & Presentation Skills
- Research & Publications
- Analytical & Investigative Skills

PROFESSIONAL EXPERIENCE

CASPAM, BZU, Multan, Pakistan
Working as *"Professor"*, February 2021 – Present
Responsibilities/ Accomplishments:

- Meticulously teaching courses pertaining to mathematical concepts and actuarial science
- Dedicatedly providing tutoring and academic counseling to students, maintaining class related records, and assessing student coursework. Collaborating and supporting colleagues regarding research interests and co-curricular activities

Institut de Mathématiques de Jussieu, Paris, France
Worked as *"Visiting Researcher",* September 2019 – August 2023
Responsibilities/Accomplishments:

- Collaborated investigations. Cordially attended faculty-organized training meetups. Promoted awareness about educational institute's endeavors and forging gainful, long-lasting partnerships that will endure once stay ends

CASPAM, BZU, Multan, Pakistan
Worked as *"Associate/Assistant Professor"*, October 2009 – February 2021
Responsibilities/ Accomplishments:

- Effectively planned, organized, and instructed mathematics classes to promote student success in college setting. Worked with other faculty to evaluate, revise, and develop curriculum to help ensure student mastery of course content
- Adeptly instructing on established courses; conceiving, refining, and teaching novel lecture series

Administrative/ Postdoctoral Research Experience

- Worked as "*Director – Sub-Campus Vehari*" in Bahauddin Zakariya University, From October 2020 – October 2022
  Responsibilities/ Accomplishments:
- Supported department mission which centers on student learning through quality instruction, curriculum enhancement & faculty service. Assisted with implementing policies, objectives, and functions in accordance with the university philosophy, mission, and procedures; participated in staff and committee work as requested; engaged with HEC & HED for accreditation and funding
- More than 15 years of postdoctoral research experience including writing articles, supervising MS/PhD students, reviewing articles and evaluating research projects

Ph.D. & MS Students Supervised

Ph.D. Students:
- Supervised=0
- Under Supervision=02

MS/M.Phil. Students:
- Supervised=40
- Under Supervision=05

HONORS & AWARDS

- Won HEC Indigenous Ph.D. Fellowship, for Ph.D. in Mathematics (2004)
- Third position holder as young speaker at 4th International Conference on 21st Century Mathematics, Lahore (2009)
- Deputy Group Leader of Pakistan Team in National Mathematics Olympiad of Spain (2009)

PROFESSIONAL AFFILIATIONS & SERVICES

- *Vice President*:
  National Mathematical Society of Pakistan

- *Member:*
  International Mathematical Union, Pakistan Mathematics Society

- *Academic Reviewer:*
  Quaestiones Mathematicae (Journal)
  AMS Mathematical Reviews
  Electronic Journal of Graph Theory and Applications (Journal)

PROFESSIONAL QUALIFICATION

Institute de Mathe`matiques de Jussieu-Paris Rive Gauche, Paris, France (2020)
Post-Doctorate
Abdus Salam School of Mathematical Sciences (ASSMS), GC University Lahore, Pakistan (2009)
Ph.D. – Mathematics
Thesis title: *"Combinatorial Group Theory of Braid Groups"*
Supervisor: Prof. Dr. Barbu Berceanu (Romania)
University of Peshawar, Peshawar, Pakistan (2002)
M.Sc. – Mathematics

PROFESSIONAL CONFERENCES, PRESENTATIONS & WORKSHOPS (International)

- Winter Braids X, School on **Braids and Lower Dimensional Topology**, Pisa Italy (17 – 21 February 2020)
- The Second Sharjah International Mathematics Spring School on *Algebra, Analysis, Topology and their Application*, University of Sharjah, UAE (24 - 25 July 2019)
- *Knots in Hellas: International Conference* on knots, low-dimensional topology and applications, presented at International Olympic Academy (IOA), Ancient Olympia, Greece (July 2017)
- School and Conference on *Knot Theory and its applications in Biology* at ICTP, Trieste, Italy (May 2009)
- Conference on Knots and other Entanglements in Biopolymers: Topological and Geometrical Aspects of DNA, RNA and Protein Structures at ICTP, Trieste, Italy (September 2008)
- CASPAM International Conference on *Mathematics and Applications* (CICMA) (November 2017)
- Conference on *Knots and other Entanglements in Biopolymers* at ICTP, Trieste, Italy (September 2008)

PROFESSIONAL CONFERENCES, PRESENTATIONS & WORKSHOPS (National)

- 3rd Summer School *" New Trends in Mathematical Sciences"* University of Shangla Pakistan (26 – 30 July 2023)
- 1st Summer School " **New Trends in Mathematical Sciences**'' University of Swat Pakistan (08 – 14 August 2021)
- 1st - 4th International Conference on "*21st Century Mathematics"*, at ASSMS, GCU, Lahore, Pakistan
- 1st - 2nd International Conference on "*Mathematics and its Applications in Information Technology"* at LUMS, Lahore, Pakistan (March 2008, November 2005)
- Mathematics Conference at Center for "*Advanced Studies in Pure and Applied Mathematics"*, Bahauddin Zakariya University, Multan, Pakistan (July 2007)
- Symposium on "*Graph Theory and Its Applications"*, at Centre for Advanced Studies in Pure and Applied Mathematics, BZU Multan (March 2018)
- Workshop on "*Algebraic Topology"* by Alexandru Dimca (Université de Nice Sophia Antipolis) held at ASSMS, Lahore
- A Workshop on "*Computational Aspects of Singularity Theory"*, ASSMS, Lahore, Pakistan (July 2010)

EXPERIENCE AS ORGANIZER OF CONFERENCES, SEMINARS & WORKSHOPS (INTERNATIONAL)

- Worked as local organizer for the *"Eminent Professors Lectures Program"* (Michel Wald Schmidt) (November 22,23 2015)
- Worked as Chair of Sponsorship Committee for the *"CASPAM International Conference on Mathematics and Application"* (November 06,07 2017)

EXPERIENCE AS ORGANIZER OF CONFERENCES, SEMINARS & WORKSHOPS (NATIONAL)

- Worked as Collaborator and Referee for the *"IUB Mathematical Olympiad"* (December 07 2018)
- Worked as Sponsor/Collaborator for the 1st Summer School "*New Trends in Mathematical Sciences",* University of Swat, Pakistan (August 08 - 14 2021)
- Worked as Chair of Sponsorship Committee and Protocol Committee for the *"CASPASM Regional Student Olympiad of Mathematics"* (12 March 2014, 23 April 2015, 12 May 2016, 19 April 2018, 16 April 2019, 05 October 2023)

RESEARCH GRANTS/ PROJECTS

- *Title: Interplay between Knot Theory and Matroids*
  Sponsored by: Innovative Learning Pakistan, 2019 (Successfully completed as PI), Amount: 3900 (Euro)
- *Title: Degree-based topological indices of Polysaccharides: amylose and blue starch iodine complex*
  Sponsored by: Deanship of Scientific Research Saudi Arabia (Nasher Track# 206152), 2020 (Successfully completed as corresponding author), Amount: 30000 (SAR)
- *Title: Properties of extremal graphs for general sum-connectivity index of transformation graphs*
  Sponsored by: Deanship of Scientific Research Saudi Arabia (Nasher Track# 216021), 2021 (Completed), Amount: 30000 (SAR)
- *Title: Sharp bounds for the inverse sum index of graph operations*
  Sponsored by: Deanship of Scientific Research Saudi Arabia (Nasher Track# 216006), 2021 (Successfully completed as corresponding author), Amount: 30000 (SAR)
- *Title: Combinatorial Properties of Simple Braids and Fibonacci Numbers*
  Sponsored by: Higher Education Commission of Pakistan, 2010 (Successfully completed initially as Co-PI and then as a PI), Amount: 0.5 million

1. A. Rani, A. Fahad, I. F. Hussain, **U. Ali**, M. Ashraf A, Comparison between Certain Graph Parameters of Bi-swapped Networks and its Maximal Twin-Preserving Subgraphs with Application in Determining Complexity, Measurement Sciences and Technology, 2024, 35, 1-24. 413-425, (2024) **W**
2. S. A. Bokhary, K. Wahid, **U. Ali**, et al., Resolvability in Subdivision Graph of Circulant Graphs, Symmetry 2023, 15(4), 867 (2023) **W**
3. X. Zhang, M. Salman, A. Rani, R. Tanveer, **U. Ali**, Z. Shao, Metric Identification of Vertices in Polygonal Cacti, Computer Modeling in Engineering & Sciences, 136: 01, 883-899, (2023) **X**
4. I. F. Hussain, **U. Ali (Corresponding author)**, An Independence System as a Knot Invariant, Punjab University Journal of Mathematics, 55(11-12), 413-425, (2023) **X**
5. M. Fazil, I. F. Hussain, A. Akbar, **U. Ali (Corresponding author)**, On Some Variations of Dominating Identification in Graphs, Kuwait Journal of Science, 49: 04, (2022) **W**
6. I. F. Hussain, S. Afridi, A. M. Qureshi, G. Ali, **U. Ali (Corresponding author)**, Fault-Tolerant Resolvability of Swapped Optical Transpose Interconnection, Journal of Mathematics, Article ID 8200046, 06 pages, (2022) **Y**
7. Zill –E- Shams, M. Salman, **U. Ali (Corresponding author)**, On Maximal Det-Independent (Res-Independent) in Graphs, Graphs and Combinatorics, 38:44, (2022) **X**
8. M. Akram, **U. Ali**, G. S. Garcin, Z. Niaz, 2-Tuple Linguistic Fermatean Fuzzy MAGDM Based on the WASPAS Method for Selection of Solid Waste Disposal Location, Mathematical Biosciences and Engineering, 20(2): 3811–3837, (2022) **X**
9. I. F. Hussain, A. Rani, **U. Ali (Corresponding author)**, On the Existence of Fault-Tolerant Numbers of Two-Bridge Knots, Scientific Inquiry Review, 6(4):108-131, (2022) **Y**
10. A. Rani, M. Imran, A. Razzaque, **U. Ali**, Properties of Total Transformation Graphs for General Sum-Connectivity Index, Complexity, 2021, Article ID 6616056, 06 pages, (2021) **W**
11. I. F. Hussain, **U. Ali (Corresponding author)**, The Conway Gordian Graph, Comptes rendus de l'Acad_emie bulgare des Sciences, 74(6), 801-811, (2021) **X**
12. Z. Shams, M. Salman, Z. Ullah, **U. Ali (Corresponding author)**, Minimum Partition of an r-Independence System, Journal of Mathematics, 2021, Article ID7163840, 10 pages, (2021) **Y**
13. A. Rani, M. Imran, **U. Ali (Corresponding author)**, Sharp Bounds for the Inverse Sum Indeg Index of Graph Operations, Mathematical Problems in Engineering, 2021, Article ID 5561033, 11 pages, (2021) **X**
14. G. Abbas, A. Rani, M. Salman, T. Noreen, **U. Ali (Corresponding author)**, Hosoya Properties of the Commuting Graph Associated with the Group of Symmetries, Main Group Metal Chemistry, 44, 173-184, (2021) **Y**
15. A. Rani, **U. Ali (Corresponding author)**, Degree-Based Topological Indices of Polysaccharides: Amylose and Blue Starch-Iodine Complex, Journal of Chemistry, 2021, Article ID 6652014, 10 pages, (2021) **X**
16. Lei Din, S. A. Bokhary, M. Rehman, H. Mubeen, Q. Iqbal, J. Liu, **U. Ali**, Degree-Based Indices of Some Complex Networks, Journal of Mathematics, 2021, Article ID 5531357, 16 pages, (2021) **Y**
17. K. Wahid, A. Das, A. Rani, S. Amanat, M. Imran, **U. Ali (Corresponding author)**, On Twin Preserving Spanning Subgraph, Journal of Intelligent & Fuzzy Systems, 40(5), 9505-9513, (2021) **X**
18. A. Haider, **U. Ali (Corresponding author)**, M. Ansari, Properties of Tiny Braids & Associated Commuting Graph, J. Algebraic Combinatorics., 53, 147-155, (2021) **W**
19. F. E. Alsaadi, S. A. Bokhary, A. Shah, **U. Ali**, J. Cao, M. O. Alasaafi, M. Rehman, On Knowledge Discovery and Representation of Molecular Structure Using Topological Indices, Journal of Artificial. Intelligence and   Soft Computing. Research, 11(1), 21-32, (2021) **X**
20. C. C. Wei, M. Salman, **U. Ali (Corresponding author)**, M. U. Rehman, M. A. Ahmad, M. H. Chaudhary, F. Ahmad, Some topological invariants of graphs associated with the group of symmetries, Journal of chemistry, 2020, Article ID 6289518, 13 pages, (2020) **W**
21. **U. Ali (Corresponding author)**, M. Saleem, A. M. Qureshi, I. Riaz, M. Shah. W. Gao, A variant of the knotting number of a knot with applications in the topology of biomolecules, Europhysics Letters, 131, 50004, (2020) **W**
22. M. Sarwar, M. Akram, **U. Ali**, Double dominating energy of m-polar fuzzy graphs, Journal of Intelligent & Fuzzy Systems, 38(2) 1997-2008, (2020) **W**
23. G. Abbas, **U. Ali**, M. Munir, S. A. Bokhary, S. M. Knag, Power graph and exchange property for resolving sets, Open Mathematics, 17(1), 1303-1309, (2019). **W**
24. **U. Ali (Corresponding author)**, S. A. Bokhary, K. Wahid, G. Abbas, On the resolvability of a graph associated to a finite vector space, Journal of Algebra and its Applications, 1950029 (10 pages) (2019). **W**
25. M. S. Akhtar, **U. Ali (Corresponding author)**, G. Abbas, M. Batool, On the game chromatic number of splitting graphs of path and cycle, Theoretical Computer Sciences, 795, 50-56, (2019). **W**
26. Z. Hussain, S. M. Kang, M. Rafique, M. Munir, **U. Ali**, A. Zahid, M. S. Saleem, Bounds for partition dimension of M-wheel, Open Physics, 17(1) (2019) 340-344. **W**
27. M. Fazil, M. Murtaza, M. Z. Ullah, **U. Ali**, Imran Javaid, On distinguishing Number of Functigraphs, Symmetry, 10(8) 332, 1-11, (2018) **W**
28. **U. Ali (Corresponding author)**, A. Riaz, M. Arshad, Mathematical Reports, On the Centralizer of Generators in 3-Braid Group, 20(70), 29-37, (2018) **W**
29. S. A. Bokhary, **U. Ali**, S. Maqbool, Irregular total labelling of wheel related graphs, Utilitas Mathematica, 107, 231- 242, (2018) **W**

32. M. Fazil, **U. Ali**, I. Javaid, M. Salman, On some parameters related to fixing sets in graphs, Journal of Prime Research in Mathematics, 14, 1-12, (2018) **Y**

33. **U. Ali (Corresponding author)**, A. Q. Baig et. al., On Topological Properties of Certain Boron Nanostructures, Journal of Computational and Theoretical. Nanoscience, 14, 887-889, (2017) **W**

34. M. Fazil, I. Javaid, M. Salman, **U. Ali**, Locating-Dominating Sets in Hypergraphs, Periodica Mathematica Hungarica, 72, 224-234, (2016). **W**

35. **U. Ali**, B. Berceanu, Canonical Forms of positive Braids, Journal of Algebra & its Application, 14(1), 27 pages 1450076, (2015) **W**

36. **U. Ali (Corresponding author)**, F. Azam, A. Haider, I. Javaid, Braids with Trivial Simple Centralizer, Algebra Colloquium, 22:4, 561-566, (2015) **W**

37. N. Yasmin, A. Younus, **U. Ali**, S. Mirza, Stability Criteria for volterra indegro-dynamic System, Advances in Mathematical Physics, 2015, article ID 365328, 1-11, (2015) **W**

38. S. Naz, M. Salman, **U. Ali**, I. Javaid, S. A. Bokhary, On the metric Demission of Generalized Peterson Graph P (n,4), Acta Mathematica Sinica, English Series, 30(7), 1145-1160, (2014). **W**

39. **U. Ali (Corresponding author)**, A. Haider, Centralizer of braids and Fibonacci numbers, Utilitas Mathematica, 89, 289-296, (2012) **W**

40. **U. Ali (Corresponding author)**, Z. Iqbal & S. Nazir, Canonical Forms and Infimum of Positive braids Algebra Colloquium,18, Special Issue, 1007-1016, (2011) **W**

41. **U. Ali (Corresponding author)**, Conjugacy Classes of 3-Braid Group, Algebra Colloquium, 17, Special Issue, 829-840, (2010) **W**

REFERENCES