

# DR. MUHAMMAD UMAR MIRZA

Researcher in AI, Graph Theory & Fuzzy MCDM

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## Professional Summary

Researcher in Artificial Intelligence, Graph Theory, and Fuzzy Multi-Criteria Decision-Making (MCDM). Work focuses on computational approaches to complex decision problems and AI-driven fuzzy models. Passionate about interdisciplinary applications in engineering, stock markets, and data science. PhD with 3.99 CGPA and 10+ publications.

## Research Interests / Areas of Expertise

- Graph Theory
- Fuzzy Sets
- Machine Learning
- Fuzzy Multi-Criteria Decision-Making (MCDM)
- Decision Making
- Web Development

**Technical Skills:** MATLAB, LaTeX, Python, Microsoft Excel

## Education

### PhD Mathematics

University of Lahore, Pakistan (2021-2025)

CGPA: 3.99/4.00

### Master of Science in Mathematics

Virtual University, Pakistan (2017-2020)

CGPA: 3.29/4.00

## Publications (11 total)

1. A generalized operational matrix of mixed partial derivative terms with applications to multi-order fractional partial differential equations — Alexandria Engineering Journal
2. A comprehensive study on fuzzy and crisp graph indices: generalized formulae, proximity and accuracy analysis — AIMS Mathematics
3. Generalized rho-dependent polynomials of topological indices of the identity graph for the ring  $Z_\rho$  — Punjab University Journal of Mathematics
4. Machine Learning Driven Exploration of Energies and Generalization of Topological Indices for the Fuzzy Conjugate Graph of Dihedral Group — IEEE Access
5. Innovative Bonferroni Mean Product and Linear Diophantine Fuzzy Bipartite Decision Graphs With Application to Sustainable Development — IEEE Access
6. The Linear Diophantine Fuzzy Z-Numbers Set: Development and Application to Decision Making in Textile Engineering Using the Bonferroni Mean Operator — IEEE Access
7. Entrepreneurship after retirement: a fuzzy multi-attribute decision-making model with machine learning — Entrepreneurship and Small Business Review
8. Decision-making framework for urban transportation using linear Diophantine fuzzy Z-numbers with Dombi aggregation, TOPSIS and VIKOR methods — Spectrum of Operational Research
9. Generalization of the identity graph of symmetric group  $S_\eta$  and some of its topological indices — Palestine Journal of Mathematics
10. Optimal allocation of renewable energy resources in a smart grid under neutrosophic credibility-based uncertainty — Ain Shams Engineering Journal
11. A Novel Intuitionistic Fuzzy Approach to Multi-Attribute Decision-Making for Engineering Design Optimization in the Aerospace Industry — Soft Computing

## Professional & Teaching Experience

**Visiting Lecturer**, Islamia University Bahawalpur (Feb 2016 - Feb 2024)

- Taught: Graph Theory, Group Theory, Measure Theory, Discrete Mathematics, and Topology.
- Introduced computational mathematics and trained students in MATLAB, LaTeX, Overleaf, MathType, and Microsoft Excel.

**Senior Headmaster**, GHS Soondha, SED Punjab (Jan 2025 - Present)

**Secondary School Educator**, GHS Soondha, SED Punjab (Aug 2016 - Dec 2024)

## Academic Achievements & Additional Information

- Achieved 3.99 CGPA and authored/co-authored 11 publications during PhD in Mathematics.
- Scored in the 99th percentile on the GAT examination for M.S. admission.
- Served as Keynote Speaker at a seminar hosted by COMSATS University, with multiple speaking engagements at academic conferences and seminars.