

Personal Information

Name: Dr. Ubaida Fatima

Role Title: Assistant Professor | Computational Science & AI Researcher

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Professional Summary

Experienced researcher and educator with a Ph.D. in Applied Mathematics, specializing in fuzzy machine learning, social network analysis, and topological data analysis for healthcare, finance, and business intelligence. Passionate about interdisciplinary research, I have a proven track record of impactful publications and successful supervision of undergraduate, master's, and Ph.D. students. Skilled in computational modeling and data-driven decision-making, I integrate advanced AI techniques to solve real-world challenges.

Relevant Work Experience

Assistant Professor (Full-Time)

NED University of Engineering & Technology | April 2021 – Present

- Teach undergraduate and postgraduate courses in mathematics, computational science, and artificial intelligence.
- Supervising final-year projects, 9 MS theses this semester (19 in total), and 3 PhD research scholars in applied mathematics, data science, and network analysis
- Conduct interdisciplinary research in healthcare, finance, and business intelligence, integrating machine learning and social network analysis.

Visiting Assistant Professor (Part-Time, Evening)

Sindh Madrasa-tul-Islam University | September 2020 – July 2022

- Taught Ph.D. courses, including Mathematics for Artificial Intelligence and Mathematics in Healthcare.
- Developed course materials to bridge mathematical theories with mathematics, AI and healthcare applications.
- Guided Ph.D. scholars, promoting analytical thinking and problem-solving skills.

Contract Lecturer (Full-Time)

Department of Mathematics, NED University of Engineering and Technology, Karachi | July 2015 – February 2021

- Taught undergraduate and postgraduate courses in mathematics, including calculus, linear algebra, differential equations, probability and statistics, and numerical methods.
- Supervised final-year projects and theses, mentoring students in research and analytical problem-solving.
- Contributed to curriculum development and academic advising, fostering a strong learning environment.

Visiting Lecturer (Part-Time, Evening)

UBIT, University of Karachi – Department of Computer Science | 2014 – 2017

- Taught courses in **Software Engineering, Project Management, Numerical Computing, and Operations Research** for BSCS, BSSE, and MCS programs.
- Conducted lab sessions on **MATLAB, Microsoft Excel, and C++**, providing hands-on training in computational techniques and programming.
- Mentored students in project development and problem-solving, enhancing their technical and analytical skills.

Internship Experience

- **Liaquat National Hospital, Karachi (2009) – 4 Weeks**
Gained hands-on experience with X-ray units, fluoroscopy, MRI, CT scan, nuclear medicine, gamma cameras, ICU ventilators, and biomedical workshop operations.
- **Jaffrey Medical Co-operation (2010) – 4 Weeks**
Worked in the Biomedical Instrumentation Workshop, focusing on dialysis machines, X-ray tubes, patient monitors, and soldering techniques.
- **Dow International OJHA Campus, Dow University of Health Sciences, Karachi (2011) – 5 Months**
Trained on biomedical equipment across multiple departments, including hematology, radiology, biochemistry, ophthalmology, ICU, neonatal care, and biomedical instrumentation workshops.

Education

Ph.D. in Mathematics (2021)

NED University of Engineering and Technology, Karachi, Pakistan

- **CGPA:** 3.27
- **Thesis Title:** *Fuzzy Social Network Analysis Techniques and Applications in Business Intelligence.*

MS in Applied Mathematics (2014)

NED University of Engineering and Technology, Karachi, Pakistan

- **CGPA:** 3.93
- **Thesis Title:** *Modification of Google Fuzzy PageRank Algorithm – An Application of Computational Linear Algebra.*

BE in Biomedical Engineering (2011)

NED University of Engineering and Technology, Karachi, Pakistan

- **First Division**

Intermediate (Pre-Engineering) (2006)

DHA Degree College for Women, Karachi, Pakistan

- **Grade:** A (73.8%)

Matriculation (Science Group) (2004)

Happy Home Secondary School, Karachi, Pakistan

- **Grade:** A-1 (82.3%)

Certifications

- **Understanding Research Methods** – University of London (via Coursera), Nov 2024
- **ACM Reviewer Training and Certification** – Association for Computing Machinery (ACM), Feb 2025 (100% Score)
- **Certified Peer Reviewer** – IEEE Access (50+ articles reviewed), MethodsX (Elsevier), The Journal of Supercomputing (Springer), BMC Public Health, International Journal of Data Science and Analytics, Scientific Reports, International Journal of Machine Learning and Cybernetics.
Web of Science Researcher ID: KIH-7332-2024.

Trained in **ethical peer review, manuscript evaluation, and research integrity**, contributing to high standards in **AI, computational science, and healthcare research.**

Peer-Reviewed Journal Publications

1. Ubaida Fatima, Saman Hina, Muhammad Wasif, "Analysis of Community Groups in Large Dynamic Social Network Graphs through Fuzzy Computation", Systems and Soft Computing, Accepted 9th April 2025.
2. K. Noor and U. Fatima, "Meta Learning Strategies for Comparative and Efficient Adaptation to Financial Datasets," in *IEEE Access*, vol. 13, pp. 24158-24170, 2025, doi: 10.1109/ACCESS.2024.3516490.

3. Kinza Muneer, Ubaida Fatima . Cryptocurrencies Analytics with Machine Learning and Human-centered Explainable AI: Enhancing Decision-Making in Dynamic Market. International Journal of Computer Applications. 186, 62 (Jan 2025), 52-67. DOI=10.5120/ijca2025924418.
4. Rabia Khushal, Dr. Ubaida Fatima, Machine learning and Fuzzy logic fusion approach for osteoporosis risk prediction, MethodsX, Volume 14, 2025, 103152, ISSN 2215-0161, <https://doi.org/10.1016/j.mex.2024.103152>.
5. Rabia Khushal, Ubaida Fatima, A novel fuzzy three-valued logic computational framework in machine learning for medicine dataset, Computers in Biology and Medicine, Volume 186, 2025, 109636, ISSN 0010-4825, <https://doi.org/10.1016/j.combiomed.2024.109636>.
6. Yusra Khan, Ubaida Fatima . Elevating Social Network Analysis with a Graph Network and Reinforcement Learning Integration for Node Importance. International Journal of Computer Applications. 186, 55 (Dec 2024), 61-70. DOI=10.5120/ijca2024924279.
7. Ubaida Fatima, Sadia Kiran, Muhammad Fouzan Akhter, Muhammad Kumail, Jaweria Sohail . Unveiling the Optimal Approach for Credit Card Fraud Detection: A thorough Analysis of Deep Learning and Machine Learning Methods. International Journal of Computer Applications. 186, 55 (Dec 2024), 32-40. DOI=10.5120/ijca2024924274.
8. Khushal R and Fatima U (2024). Fuzzy logic and machine learning for diabetes risk prediction using modifiable factors. International Journal of Advanced and Applied Sciences, 11(12): 225-231.
9. A. Moiz, U. Fatima and M. Zeeshan Ul Haque, "A New Framework for Pinpointing Crucial Proteins in Protein-Protein Interaction Networks," in IEEE Access, vol. 12, pp. 108425-108444, 2024, doi: 10.1109/ACCESS.2024.3437215. **(Impact Factor: 3.4)**
10. Rabia Khushal, Ubaida Fatima, *Fuzzy machine learning logic utilization on hormonal imbalance dataset*, Computers in Biology and Medicine, Volume 174, 2024, 108429, ISSN 0010-4825, <https://doi.org/10.1016/j.combiomed.2024.108429>. **(Impact Factor: 7)**
11. Ubaida Fatima, Saman Hina, Muhammad Wasif, "A novel global clustering coefficient-dependent degree centrality (GCCDC) metric for large network analysis using real-world datasets", Journal of Computational Science, Volume 70, 2023, 102008, ISSN 1877-7503, <https://doi.org/10.1016/j.jocs.2023.102008>. **(Impact Factor: 3.1)**
12. Naz, Samia & Hina, Saman & Fatima, Ubaida & Tabassum, Huma. (2023). A Hybrid Approach to Measure Students' Satisfaction on YouTube Educational Videos. International Journal of Emerging Technologies in Learning (IJET). 18. 131-147. 10.3991/ijet.v18i09.38473. (X- category)
13. Ubaida Fatima and Dr. Saman Hina, "Efficient Algorithm for Maximal Clique Size Evaluation", published in International Journal of Advanced Computer Science and Applications (IJACSA), August 2019. (Peer-reviewed International Journal) **(Impact Factor: 0.7)**
14. Fatima Sughra Zaidi, Ubaida Fatima, Bilal Ahmed Usmani, and Ali Raza Jafri, "Comprehending Nodes Essentiality through Centrality Measures in Biological Networks", published in IJCSNS International Journal of Computer Science and Network Security, VOL.19 No.9, September 2019. (Peer-reviewed International Journal)
15. Dr. Tahseen Ahmed Jilani, Ubaida Fatima, Prof. Dr. Mirza Mahmood Baig, "A Survey and Comparative Study of Different PageRank Algorithms" published in International Journal of Computer Applications (IJCA), 2015.
16. Dr. Tahseen Ahmed Jilani, Ubaida Fatima, Prof. Dr. Mirza Mahmood Baig, "Fuzz-PageRanking for Google Search Engine" published in International Journal of Computer Science Issues (IJCSI).
17. Dr. Tahseen Ahmed Jilani, Shaista Rais, Ubaida Fatima, Dr. Shabnam Rais, "Bayesian Networks Approach to Diagnose Diabetes Type-2 In Pakistan" published in International Journal of Science and Research (IJSR).

18. Faiza Khan, Madiha Fatima, Usman Tariq Alvi, Dr. Tahseen Jilani and Ubaida Fatima, "Comparative Study of Similarity Measures in Link Prediction Using Facebook Data" submitted to International Journal of Computer Science and Information Security (IJCSIS).
19. Shahid Hussain, Ubaida Fatima . *Exploring Machine Learning Utilization using Real-Life Dataset for Influenza Pandemic*. International Journal of Computer Applications. 186, 65 (Feb 2025), 8-18. DOI=10.5120/ijca202592441
20. Komal Batool, Ubaida Fatima, Mirza Faizan Ahmed . *Trend Prediction of DJIA index based on News Extraction from Yahoo Finance*. International Journal of Computer Applications. 186, 64 (Feb 2025), 42-46. DOI=10.5120/ijca202592437.

Articles that are presently submitted to Peer-Reviewed Journals and are under review:

1. Ubaida Fatima, Saman Hina , Muhammad Wasif, "A novel Dangling Centrality (ϕ_c) metric and its Comparison with Centrality Measures for Real-life Datasets", submitted to JCR Journal "Journal of Big Data".
2. Hafiza Saba Khan, Ubaida Fatima, Kashif Asrar et al. Challenges in Online Social Networks (OSNs) Deal with Machine Learning Algorithms, 20 May 2024, PREPRINT (Version 1) available at Research Square [<https://doi.org/10.21203/rs.3.rs-4387435/v1>].
3. Engr. Abdul Moiz, Dr. Ubaida Fatima, Dr. M Zeeshan-Ul-Haque, A novel modified TOPSIS approach to predict vital proteins in PPI networks, submitted to MethodsX.

International Conference Publications

Attended the **2024 International Visualization, Informatics, and Technology Conference (IVIT) at Universiti Kuala Lumpur on August 7-8, 2024**, where I presented two research papers:

1. **A. Moiz and U. Fatima**, "Key Element Identification in Large Biological Datasets: An MCDM Comparative Study," 2024 International Visualization, Informatics, and Technology Conference (IVIT), Kuala Lumpur, Malaysia, 2024, pp. 153-158, doi: 10.1109/IVIT62102.2024.10692773.
2. **R. Khushal and U. Fatima**, "Fuzzy Computing in Healthcare," 2024 International Visualization, Informatics, and Technology Conference (IVIT), Kuala Lumpur, Malaysia, 2024, pp. 78-83, doi: 10.1109/IVIT62102.2024.10692652.

Presentations and Lectures

Conference Lecture Presentation: Presented a contributed lecture at the **SIAM Conference on Computational Science and Engineering (CSE25)** on "A New Dangling Centrality Metric and Its Comparison with Existing Centrality Measures for Real-World Datasets." Actively engaged in discussions on GPU modeling and machine learning advancements, gaining insights into advanced computational techniques and their applications in large-scale data analysis.

Session Chair and Academic Contributions

- Chaired a session at the **1st International Conference on Emerging Trends in Biomedical Engineering, Science and Technology (ICETBEST) 2024** (February 28-29, 2024).
- Chaired a technical session at **INMIC 2024 (December 30-31, 2024)**, facilitating discussions and ensuring an engaging session. Two of my supervised students presented their research on meta-learning, machine learning, and data science applications, with their work forthcoming in IEEE Xplore.
- **Served as a peer reviewer at INMIC 2024**, evaluating posters and project presentations and providing constructive feedback to researchers and participants.

Relevant Skills:

- **Technical:** Skilled in R, MATLAB, Python, SPSS, C++, Gephi, and Minitab, which I use in both teaching and research.
- **Expertise:** Apply AI, Machine Learning, Network Analysis, Fuzzy Logic, and Data Science in my work.
- **Soft Skills:** Focus on mentoring, problem-solving, teamwork, and effective communication in research and supervision.