



Dr. Zaffar Mehdi Dar

Assistant Professor

Department of Mathematics

School of Engineering

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1. ABOUT

Dr. Zaffar Mehdi Dar is an Assistant Professor in the Department of Mathematics, School of Engineering, Dayananda Sagar University, Bengaluru. He earned his Ph.D. in Mathematics from Vellore Institute of Technology (2026), where his thesis focused on the **Virtual Element Analysis of Time-fractional PDEs with Applications in Neurodegenerative Diseases**. His research expertise spans **fractional-order PDEs, finite and virtual element methods, dissipative wave dynamics, protein misfolding, and epileptic seizure modeling**. He has published extensively in SCI/SCIE journals including *Alexandria Engineering Journal*, *Mathematics in Engineering*, *Axioms*, *Fractal and Fractional*, *IEEE Access*, and *Journal of Computational and Applied Mathematics*. He has presented at international conferences in India and abroad, and actively contributes as a reviewer for Springer journals. His teaching experience includes advanced mathematics courses and mentoring in applied numerical methods.

2. RESEARCH INTERESTS

- Time-fractional PDEs (linear and nonlinear)
- Finite Element Method (FEM)
- Virtual Element Method (VEM)
- Dissipative wave modeling
- Protein misfolding and tumor growth
- Epileptic seizure propagation across neural domains

3. ACADEMIC QUALIFICATIONS

- Ph.D. in Mathematics — Vellore Institute of Technology, India, 2026
- M.Sc. in Mathematics — Jamia Millia Islamia (Central University), Delhi, India, 2021
- B.Sc. in Mathematical Sciences — University of Delhi, India, 2018

4. PROFESSIONAL EXPERIENCE

- Assistant Professor — Dayananda Sagar University, Bengaluru (Nov 2025 – Present)
- Teaching & Research Assistant — Vellore Institute of Technology, Vellore (Jan 2022 – Dec 2024)
- Project Associate — Dept. of Mechanical Engineering, VIT Vellore (Feb 2025 – Apr 2025)
- Subject Matter Expert (Mathematics) — Evelyn Learning Pvt. Ltd., New Delhi (Oct 2019 – Mar 2020)

5. RESEARCH HIGHLIGHTS

- **Publications:** 11 SCI/SCIE indexed papers, several under review and preparation
- **Books/Book Chapters:** Pre-print contributions on fractional PDEs and VEM methods
- **Research Projects:**

- SEED Grant (VIT) on geophysical PDE applications (Completed)
- Spanish Ministry of Science project on dielectric lenses (Under Evaluation)
- ANRF project on dissipative wave dynamics in epilepsy (Submitted)
- **Reviewer:** *Computational Mathematics and Modeling (Springer)*, *Boundary Value Problems (Springer)*
- **Conference Roles:** Speaker at IGCM2023 (IISc Bangalore), ICMA2024, LACAM2024, CMMSE2025 (Spain), CMMSE2026 (Spain)

6. SELECTED PUBLICATIONS

1. **Zaffar Mehdi Dar**, M. Chandru, H Ramos, "Modeling Tumor Micro-scale Dynamics via Virtual Element Methods on Polygonized Square and Disk Domains," *International Journal of Computer Mathematics-T & F.* 1-26, 2026.
2. **Zaffar Mehdi Dar**, Arrutselvi M, Chandru M, S. Natarajan, G. Manzini, "A Conforming Virtual Element Framework for the Time-fractional Semi-linear Reaction-Diffusion Equation on Polygonal Meshes," *Journal of Computational and Applied Mathematics.* Volume 476, 117100, 2026.
3. **Zaffar Mehdi Dar**, M. Chandru, "The $O(h^2)$ Virtual Element Method for Nonlinear Sub-diffusion Equation involving a Non-smooth Potential Parameter," *ZAMM-Journal of Applied Mathematics and Mechanics / Zeitschrift für Angewandte Mathematik und Mechanik.* 105(12), e70309, 2025.
4. **Zaffar Mehdi Dar**, M. Arrutselvi, Chandru Muthusamy, Sundararajan Natarajan, "A Conforming Virtual Element Method for Emden-Fowler Model over Polygonal meshes," *Advances in Computational Mathematics.* Volume 51(6), 47, 1-36, 2025.
5. **Zaffar Mehdi Dar**, Chandru M, "A Time-fractional Fischer-Kolmogorov Model for Protein Misfolding in Neuro-degenerative Disorders: A Virtual Element Study," *IEEE Access Journal.* Volume 13, 169504-169520, 2025.
6. **Zaffar Mehdi Dar**, Chandru Muthusamy, Higinio Ramos, "A Virtual Element Method for a $(2+1)$ -Dimensional Wave Equation with Time-Fractional Dissipation on Polygonal Meshes," *fractal and fractional.* Volume 9(7), 399, 2025.
7. **Zaffar Mehdi Dar**, M. Arrutselvi, Chandru Muthusamy, Sundararajan Natarajan, Gianmarco Manzini, "Virtual element approximations of the time-fractional nonlinear convection-diffusion equation on polygonal meshes," *Mathematics in Engineering,* Volume 7(2), 96-129, 2025.

7. ACADEMIC PROFILES

- Google Scholar: <https://scholar.google.com/citations?user=7ZG9dXYAAAAJ&hl=en>
- ORCID: 0009-0006-8106-4939
- Scopus: 9256840800
- ResearchGate: https://www.researchgate.net/profile/Zaffar-Dar-2?ev=hdr_xprf
- Web of Science: NHQ-4482-2025
- Personal/Professional Website: <https://zaffar-ssite-91fa1b.netlify.app/>

8. CONTACT

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