Dr. Farhan Mumtaz

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Status: U.S. Permanent Resident (Green Card)

EDUCATION

2021–2022	Post-Doctorate, Electrical and Computer Engineering, Missouri University of Science and Technology, Rolla, MO, USA
2018–2021	Ph.D., Information and Communication Engineering, Wuhan University of Technology, Hubei, China
2016–2018	M.Phil., Electronics, Quaid-i-Azam University, Islamabad, Pakistan
2013–2015	M.Sc., Electronics, Preston University Kohat (Islamabad Campus), Pakistan
2007–2009	MBA, Management Sciences, Sarhad University of Science and IT, Peshawar (Islamabad Campus), Pakistan
2004–2006	B.Sc., Mathematics & Physics, University of Punjab, Lahore, Pakistan

PROFESSIONAL EXPERIENCE

01/2023–Present	Assistant Research Professor / R&D Expert, Missouri University of Science and Technology, Rolla, MO, USA
12/2021–12/2022	Research Scientist / R&D Expert, Missouri University of Science and Technology, Rolla, MO, USA
09/2018–11/2021	Research Assistant, Wuhan University of Technology, Hubei, China
12/2014–10/2015	Senior Manager, Service Solution Sales, Huawei Technologies, Islamabad, Pakistan
06/2012–11/2014	Project Manager, Delivery Service & Rollout, Huawei Technologies, Islamabad, Pakistan
01/2007–05/2012	Plan Control Manager, Delivery Service & Rollout, Huawei Technologies, Islamabad, Pakistan

RESEARCH INTERESTS

- Fiber Optic Sensors and Instrumentation for Harsh Environments
- Advanced Micro/Nano-fabrication and Materials for Photonics
- Femtosecond Laser Micromachining and Optical Waveguide Devices
- Fiber Bragg Gratings and Distributed Optical Fiber Sensors
- Optical Chemical and Biosensing based on Fiber SPR and MOF Sensors

HONORS & AWARDS

- Panel Reviewer serve on Steel Research International by WILEY, 2025
- IEEE Senior Member Award, 2024
- Featured Articles in AISTech Transactions and Iron & Steel Technology Magazine, 2023–2024
- Top 2% Scientist in Optoelectronics & Photonics, 2023 (Stanford University & Elsevier database)
- SPIE COMSOL Multiphysics Excellent Trainer Award, Quaid-i-Azam University, 2021
- IEEE Best Poster Award, ICOCN, 2019
- MOFCOM Fully Funded PhD Scholarship, 2018
- Huawei Multiple Excellence Awards (Best Project and Quality Awards), 2010 to 2015

SELECTED PUBLICATIONS

Author and co-author of over **50** peer-reviewed journal articles and **18** conference proceedings published in reputed international journals and conferences.

- Mumtaz, F.*, et al. "Distributed Sapphire Fiber Bragg Grating-Based Thermal Profiling of Submerged Entry Nozzles." *IEEE Trans. Instrumentation & Measurement*, 2025.
- Yang, J., Dong, Q., Zhang, C., Zhang, W., Mumtaz, F., et al., & Nascimento, C. A. (2025). Selective electrified polyethylene upcycling by pore-modulated pyrolysis. *Nature Chemical Engineering*, **2**(7), 424–435, 2025.
- Hungund, A.P., Zhang, B., Mumtaz, F., et al. "Pendant µ-Droplet Evaporation Fabricates Fiber-Optic MOF Gas Sensor." *ACS Sensors*, 2025 (Accepted).
- Mumtaz, F.*, B. Zhang, K. Dey, J. D. Smith, R. J. O'Malley, J. Huang, "Discrimination of Temperature and Strain by Characterizing Two Femtosecond Laser-Written Coincident Sapphire Fiber Bragg Gratings for Harsh Environment Applications," *IEEE Trans. Instrum. Meas.*, vol. 1, 2025.
- O. C. Inalegwu, R. K. Saha, Y. R. Mekala, F. Mumtaz, *et al.*, "Advancing Temperature Monitoring of the Bottom Anode in Direct Current Electric Arc Furnace Operations with Distributed Optical Fiber Sensors," *IEEE Trans. Instrum. Meas.*, 2025.
- Mumtaz, F.*, Zhang, B., et al. "Discrimination of Temperature and Strain by Two Femtosecond Laser-Written Coincident Sapphire Fiber Bragg Gratings." *IEEE Trans. Instrumentation and Measurement*, 2024.
- Mumtaz, F.*, Zhang, B., et al. "Miniature Fabry-Perot Interferometer Based on Metal-Organic Framework for Benzene Detection." *ACS Applied Materials & Interfaces*, 2024.
- Mumtaz, F.*, Tekle, H., Zhang, B., et al. "Highly Cascaded First-order Sapphire Optical Fiber Bragg Gratings Fabricated by Femtosecond Laser." *Optics Letters*, 2023.
- Mumtaz, F.*, Zhang, B., O'Malley, R., and Huang, J. "Large-Scale Cascading of FBG Array in Highly Multimode Coreless Fiber." *Optics Express*, 2023.
- F. Mumtaz*, "Detection of critical cancer cells in human organs using dual demodulation photonic crystal fiber: numerical study," *Results Opt.*, vol. 12, 100493, 2023.
- F. Mumtaz*, M. Roman, B. Zhang, L. G. Abbas, Y. Dai, M. A. Ashraf, M. A. Fiaz, et al., "MXene (Ti_3C_2Tx) coated highly-sensitive D-shaped photonic crystal fiber based SPR-biosensor," *Photonics Nanostruct.-Fundam. Appl.*, vol. 52, 101090, 2022.
- F. Mumtaz*, Y. Dai, M. A. Ashraf, "Inter-cross de-modulated refractive index and temperature sensor by an etched multi-core fiber of a MZI structure," *J. Lightwave Technol.*, vol. 38, no. 24, pp. 6948-6953, 2020.

PATENTS

- Hungund, A.P., O'Malley, R., Mumtaz, F., et al. "Integrated System for Rapid Fabrication, Calibration, and Testing of Optical Fiber MOF Sensors." U.S. Provisional Patent Application.
- Huang, J., Mumtaz, F., O'Malley, R. "Multi-order Line-by-Line and Point-by-Point Sapphire Optical Fiber Bragg Gratings Using Femtosecond Laser." U.S. Provisional Patent Application.

INVITED PRESENTATIONS & SEMINARS

- SPIE Proceedings: Optical Waveguide and Laser Sensors III, 2024 (Invited)
- Maryville University – Fiber Optic Sensors and Applications, 2023 (Invited)
- IEEE, Optical Communications and Networks, Huangshan, China, 2019 (Invited)

PROFESSIONAL MEMBERSHIPS & SERVICE

- IEEE Senior Member
- Member: Optical Society of America (OSA), SPIE, AISTech
- Guest Editor, MDPI Coatings and Materials Journals
- Reviewer for IEEE Photonics, Optics Letters, Optics Express, Optics Materials Express, Measurement, IEEE Sensors Journal, IEEE Transactions on Instrumentation and Measurement, Springer Nature, Ap-

plied Physics B, MDPI Applied Sciences, MDPI Axioms, MDPI Energies, MDPI Mathematics, Optical Fiber Technology, MDPI Photonics, MDPI Sensors, MDPI Electronics, International Journal of Optics (Wiley), Journal of Sensors (Wiley), Springer Nature and others.

RESEARCH FUNDING SUPPORT

- U.S. Air Force 3D Printed Investment Casting Shell Project
- U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy (DE-EE0009119, DE-EE0009392)
- U.S. Army Research Laboratory (W911NF-21-2-0280)
- MATERIALS TECHNOLOGY INSTITUTE, INC, USA "Fiber Optic Temperature Monitoring Sensors for CPI and Refining Processes" (Award No: 0081251)
- National Science Foundation of China (51975442, 61475121)
- Major Technique Innovation Program of Hubei Province (2018AAA016)
- National Key Research and Development Program of China (2017YFB0405501)

STUDENT MENTORSHIP

PhD Students:

- Ogbole C. Inalegwu (EE, Missouri ST) – Graduated
- Anand K. Nambisan (EE, Missouri ST) – Graduated
- Nahideh S. Salehifar (EE, Missouri ST) – Graduated
- Homayoon S. Dinani (EE, Missouri ST) – In-progress
- Ruimin Jie (EE, Missouri ST) – In-progress
- Robert Abbott (CE, Missouri ST) – In-progress
- Yeshwanth R. Mekala (MSE, Missouri ST) – In-progress
- Mobashir Ahmed (MSE, Missouri ST) – In-progress
- Hanok Tekle (MSE, Missouri ST) – In-progress
- Rony K. Saha (EE, Missouri ST) – In-progress

Master Students:

- Rony K. Saha (EE, Missouri ST) – Graduated
- Abhishek P. Hungund (EE, Missouri ST) – Graduated
- Abdul Muqeet (EE, Quaid-i-Azam Univ.) – Graduated
- Ghulam Yaseen (EE, Quaid-i-Azam Univ.) – Graduated

Undergrad Students:

- Michael Davis (EE, Missouri ST) – In-progress

PROFESSIONAL TRAININGS

- BOTDR & BOTDA, OZOPTCS, Canada, 2022
- Glass Process GPX-3400, ThorLabs, USA, 2023
- COMSOL Multiphysics, Wuhan University of Technology, 2019
- Project Management, PMI, Islamabad, 2017
- Multiple Technical and Quality Trainings, Huawei Pakistan (2010–2014)

TECHNICAL SKILLS

- COMSOL Multiphysics, RSoft BPM, Femtosecond Laser Micromachining
- Fiber Optic Sensing Systems: Rayleigh OFDR, Brillouin OTDR, FBG Demodulation

- Scientific Software and Instrumentation
- Microsoft Office and Project Management Tools
- Scanning Electron Microscopy (SEM) Imaging and Analysis

REFERENCES

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