Dr MIRZA FAIZAAN

MATERIALS SCIENTIST | ADDITIVE MANUFACTURING | POLYMER COMPOSITES
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(Open to relocation)

SUMMARY OF QUALIFICATIONS

Materials researcher with 5+ years of experience in additive manufacturing (FDM/MEX-AM, SLA), polymer composites, and advanced mechanical and material characterization. Specialized in process optimization, void architecture control, and architectured lattice design for mechanical performance tuning. Demonstrated expertise in structural simulations, statistical analysis, architectured cellular geometries for multifunctional lightweighting applications. Experienced in computational analysis, simulation, and data-driven interpretation to support experimental research. Demonstrated ability to integrate experimental research, simulation, and cross-functional technical coordination in academic and applied R&D environments.

RESEARCH EXPERIENCE

CARBON NEXUS, DEAKIN UNIVERSITY, WAURN PONDS, VIC. AU OCT 2023 – APR 2024

Casual Research Assistant.

- Worked as a research assistant as part of a three-member team on the wet spinning line to produce pre-cursor fibres (white fibre) under a project for SABIC, Saudi. Responsibilities included prepared the dope mixture (PAN + DMSO), the spinneret and two filter assemblies to ensure a smooth operation on the wet spinning day, and conduct sample preparation for microscopy, single-fibre testing (FAVIMAT) and density measurements across different stages of the carbon fibre production process.

MANIPAL INSTITUTE OF TECHNOLOGY, MAHE, MANIPAL, KA. IN. JAN 2020 – MAR 2025

INSTITUTE FOR FRONTIER MATERIALS, DEAKIN UNIVERSITY, VIC. AU.

Cotutelle PhD Candidate

- Optimized process parameters (nozzle diameter, layer thickness) to control void morphology and tensile performance in PLA-based MEX-AM parts, enabling predictable stiffness tuning for lattice-based structures.
- Carried out a time-dependent accelerated weathering study on AM - PLA to establish the tensile strength and material degradation through FTIR, XRD and DSC analysis over prolonged exposure times.
- Designed and validated closed-cell architectured infill structures (cubic+octet) for lightweight, mechanically efficient FDM parts, achieving ~30% weight reduction with ~60% compressive strength retention and minimal voids.
- Developed basalt fiber-reinforced PLA composite filament using single-screw and twin-screw extrusion setups, addressing interface challenges through SEM analysis and identifying process limitations in dFRC filament fabrication.

DAYANANDA SAGAR COLLEGE OF ENGINEERING 2016 – 2017

Academic Project – B.E. Final Year

- Investigated wear reduction in Al-20Si engine blocks using laser surface treatment; achieved up to 92% increase in hardness and enhanced oil retention through microstructural refinement. Conducted tribological testing (microhardness, sliding wear, surface roughness) and optimized laser parameters using DOE and ANOVA techniques.

EDUCATION

Manipal Institute of Technology, MAHE, Manipal. KA. IN. JAN 2020 – OCT 2025

Institute for Frontier Materials, Deakin University, VIC. AU.

Doctor of Philosophy – Cotutelle PhD Program

Title: Structure-property and weathering studies of additively manufactured lightweight cellular structures.

Manipal Institute of Technology, MAHE, Manipal. KA. IN. 2017 - 2019

Master of Technology – Automobile Engineering.

DAYANANDA SAGAR COLLEGE OF ENGINEERING, BANGALORE, KA. IN. 2013 - 2017

Bachelor of Engineering – Automobile Engineering.

PROFESSIONAL EXPERIENCE

FRACKTAL WORKS PVT. LTD., BANGALORE, KA. IN. AUG 2025 - CURRENT

Chief of Staff

- Led cross-functional execution across research, engineering, and operations by designing governance, decision-authority, and escalation frameworks for a scaling additive manufacturing organisation.
- Provided senior technical judgment on additive manufacturing processes and infrastructure, including selective oversight of print-farm operations and resolution of high-impact technical escalations.
- Acted as an integration layer across technical and non-technical teams, resolving priority conflicts and execution bottlenecks without assuming line-management responsibilities.
- Established standardised technical review, documentation, and knowledge-transfer workflows to improve reproducibility, accountability, and organisational learning.
- Served as a technical subject-matter expert for external-facing technical communications, ensuring accuracy and fidelity in the translation of additive manufacturing capabilities to non-technical audiences.

EARLY INDUSTRY EXPERIENCE / INTERNSHIPS NOV 2018 – JUL 2019

AUTOMOTIVE AXLES LTD, MYSORE, KA. IN. NOV 2018 – JUL 2018

- Managed assembly and set-up of the new Robotic arm 'Ring and Cover Welding' station. Reduced processing time from 227 seconds to under 200 seconds: Weld time from 154 seconds to 142 seconds and travel time from 23 seconds to 12 seconds by ECRS optimisation methods, twin wire-arc torch and pneumatic motors over servo motors.

TVS MOTOR COMPANY LTD, MYSORE KA. IN. MAY 2018 – OCT 2018

- Diagnosed two root causes of crankshaft bearing noise and implemented standard operating procedures (SOPs) for proper handling. Developed operator training material and process improvements that reduced bearing-related engine rework and rejections to zero for two consecutive weeks.

MANIPAL INSTITUTE OF TECHNOLOGY, MAHE, MANIPAL, KA. IN OCT 2017 – APR 2018

Teaching Assistant.

PUBLICATIONS

1. Mirza Faizaan, Satish Shenoy Baloor, Srinivas Nunna et al. Temporal evolution of structure property relationship for UV+RH artificially weathered material extrusion additive manufactured PLA, 04 September 2025, PREPRINT (Version 1) available at Research Square https://doi.org/10.21203/rs.3.rs-7324138/v1
2. Mirza, F., Baloor Shenoy, S., Nunna, S. et al. A study on the overall variance and void architecture on MEX-PLA tensile properties through printing parameter optimisation. Scientific Reports (2024). https://doi.org/10.1038/s41598-025-87348-2
3. *Accepted:* Faizaan, M., Shenoy, S., & Kini, C. R. et al. Impact of Lattice Geometry on Compressive Strength: A Finite Element Analysis; Accepted in conference proceedings – Target Journal not identified.
4. Mirza, F., Baloor Shenoy, S., Nunna, S. et al. Effect of material extrusion process parameters on tensile performance of pristine and discontinuous fibre reinforced PLA composites: A review. Prog Addit Manuf (2024).https://doi.org/10.1007/s40964-024-00825-4
5. Faizaan, M., Shenoy, S., & Kini, C. R. (2024). Tensile and Flexural Performance of Hybrid FDM and Compression Moulded PLA/Basalt Biocomposite. In Materials Science Forum (Vol. 1120, pp. 77–84). Trans Tech Publications, Ltd. https://doi.org/10.4028/p-duyo7m

CONFERENCES

1. Won **Best Paper Award** for paper presented at The International Conference on Computational Methods on Engineering & Health Sciences (ICCMEH2024), organised by Manipal Institute of Technology, Manipal, Udupi, KA. IN. December 2024.
2. Poster presented at the IFM Research Conference, Geelong, VIC, AU, titled 'To what extent do FDM printing parameters really affect PLA tensile performance?'. November 2023.
3. Paper Presented in 3rd International Conference on Advances in Material Sciences 2023 (ICAMS2023); May 2023.

PATENTS

1. Design Patent: "Tensile sample mount for accelerated weathering chamber" bearing design number: 383798-001

SKILLS

DOMAIN	TOOLS & TECHNIQUES
Additive Manufacturing & Processing	FDM / MEX-AM (process optimisation, diagnostics), SLA, polymer extrusion (single-screw & twin-screw)
Material & Mechanical Characterisation	SEM, optical microscopy, µ-CT, UTM (ASTM tensile, flexural, compression), FAVIMAT+ single-fibre testing, FTIR, XRD, DSC, density measurements
Computational & Data Analysis	MATLAB (data processing, visualisation), statistical analysis (Minitab, OriginLAB), simulation-supported interpretation
CAD & CAE	SolidWorks, CATIA, ANSYS (static structural analysis)
Image & Data Processing	ImageJ, GIMP

CERTIFICATIONS

- Safety Induction and Training, Deakin University, 2023
- MATLAB Fundamentals & Introduction to statistical methods with MATLAB, Mathworks. 2021
- Scientific Writing and Publishing, Nature Masterclass, 2021

| REFERENCES AVAILABLE ON REQUEST