MIRZA FAIZAAN, PHD. (PENDING)

MATERIALS RESEARCHER | ADDITIVE MANUFACTURING | POLYMER COMPOSITES
MANIPAL, INDIA
mirzafaizaan.org

+91 97390 31247
mrzfaizaan@gmail.com
(Open to relocation)

Summary of Qualifications

Materials researcher with 5+ years of experience in additive manufacturing (FDM/MEX-AM, SLA), polymer composites, and mechanical/material characterization (SEM, FTIR, XRD, DSC, UTM). Skilled in MATLAB, SolidWorks, ANSYS, and image analysis tools like ImageJ and GIMP. Experienced in polymer extrusion, lattice structure design, and static simulations. Recognized for cross-functional collaboration, technical leadership, and academic rigor in 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.

Doctoral Candidate

- Conducted optimisation studies and established structure-property relationships for tensile performance and void characteristics as a function of nozzle diameter and layer thickness for additively manufactured (AM) parts [FDM].
    - Developed a MATLAB program to clean and analyse raw tensile data to output tensile strength, tensile modulus and plots for each sample type.
- 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.
    - Developed a MATLAB program to smooth and baseline correct FTIR, XRD and DSC raw data. Additionally, developed a program to identify and assign FTIR peaks and functional groups to output in a simple Excel sheet.
- Designed a repeating functional cellular infill structure as an alternative to conventional 100% solid additively manufactured parts for 30% lighter samples with minimal loss in specific compressive performance.
    - Used static structural simulations on different compression sample types to ensure proof of concept.

- Gained first-hand experience in polymer extrusion with single and twin-screw extruder setups. Explored the use of short fibre reinforcements in material extrusion AM.

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.

Professional Experience

FREELANCE [3D PRINTING SERVICE], MANIPAL, KA. IN. NOV 2024 - CURRENT

- Independently operated a profitable freelance 3D printing service fulfilling client orders, handling material sourcing, quotations and quality control to meet diverse client needs, demonstrating strong organisational and time-management skills.

AUTOMOTIVE AXLES LTD, MYSORE, KA. IN. NOV 2018 – JUL 2019

Project Intern.

- 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

Project Intern.

- Identified two primary root causes for crankshaft bearing noise and established SOPs for bearing handling.
- Designed a Do's and Don'ts chart to educate operators on bearing mishandling
- Successfully reduced crankshaft bearing-related engine rework and rejections on the assembly line to zero for two consecutive weeks before I departed from the establishment.
- Carried out a Value Stream Mapping (VSM) to eliminate buffer time for entirely manufactured vehicle holding locations throughout the plant and improve the value-added ratio of products.

Manipal Institute of Technology, MAHE, Manipal, KA. IN OCT 2017 – APR 2018

Teaching Assistant.

- Assistant staff member in Automotive Engineering Labs.

Education

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

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

Doctor of Philosophy [*Submitted – Pending Evaluation].

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 in Automobile Engineering.

Dayananda Sagar College of Engineering, Bangalore, KA. IN. 2013 - 2017

Bachelor of Engineering in Automobile Engineering.

Selected Publications

PUBLICATIONS

1. *Due for Submission:* Mirza, F., Baloor Shenoy, S., Nunna, S. et al. Temporal evolution of structure property relationship for UV+RH artificially weathered material extrusion additive manufactured PLA.
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 [Q1]
3. *Accepted:* Faizaan, M., Shenoy, S., & Kini, C. R. et al. Impact of Lattice Geometry on Compressive Strength: A Finite Element Analysis.
4. 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 [Q4]
5. 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 [Q1]

CONFERENCES

1. Won **Best Paper Award** for paper presented at The International Conference on Computational Methods on Engineering & Health Sciences (ICCCMEH2024), 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

- **3D Printing/Rapid Prototyping:** FDM printer diagnosis and repair. SLA.
- **Polymer Extrusion:** 3Devo single screw extruder and Wayne twin-screw extruder.
- **Microscopy:** SEM, Optical Microscopy, Micro-CT
- **Mechanical Characterisation:** UTM (ASTM – Tensile, Flexural, Compression), FAVIMAT+ Single fibre tensile testing
- **Material Characterisation:** Density column, XRD, FTIR, DSC.
- **CAD & CAE:** SolidWorks, CATIA, Ansys – Static Structural
- **Programming:** MATLAB (Data visualisation and analysis)
- **Statistics:** Minitab, OriginLAB.
- **Image Processing:** ImageJ, GIMP
- **Proficient in MS Office:** Excel Word and PowerPoint
- **IELTS (Academic):** 8.0 (2020); **GRE:** 305 (2019)

Certifications

- Safety Induction and Training, Deakin University, 2023
- Additive Technologies in Metallurgy and Mechanical Engineering, Coursera, 2021.
- MATLAB Fundamentals & Introduction to statistical methods with MATLAB, Mathworks. 2021
- Technological Leadership for Inclusive Digital Society, Sikkim Manipal Institute of Technology 2021
- Scientific Writing and Publishing, Nature Masterclass, 2021
- Research Integrity Training, Deakin University, 2021.
- 3D printing & Applications in Engineering, Indian Space Industries Exhibitors 2020
- Workshop on ‘Writing scientific and technical research paper’, Manipal Institute of Technology 2019

References

Dr Satish Shenoy B.

Prof.
Manipal Institute of Technology,
MAHE.
Manipal, KA. IN. 576104
+91 98442 32761
satish.shenoy@manipal.edu

Dr Claudia Creighton

A/Prof
Carbon Nexus, IFM
Deakin University.
Waurn Ponds, VIC. AU. 3216
+61 4 2365 2791
claudia.creighton@deakin.edu.au

Dr Srinivas Nunna

Lecturer
School of engineering
RMIT University
Melbourne, VIC. AU. 3000
+61 4 22877 718
srinivas.nunna@rmit.edu.au