Dr. Saboor Fayaz

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1. Professional Summary

Doctorate in Mechanical Engineering with expertise in Wire Arc Additive Manufacturing (WAAM), focusing on process optimization, microstructural control, and performance enhancement of stainless steel 316L. Academic foundation includes M.Tech in Machine System Design and B.Tech in Mechanical Engineering. Skilled in system design and analysis using SolidWorks, AutoCAD and ANSYS with practical experience in CFD-based fluid flow and corrosion studies, material selection, and component reliability. Proficient in testing, validation, and data acquisition using sensors for performance evaluation and failure analysis.

2. Education

1. **Doctor of Philosophy (Ph.D.)**
   Specialization:
   Wire Arc Additive Manufacturing (WAAM)
   National Institute of Technology, Srinagar
   12/2019 – 03/2025

- **CGPA:** **8.70**
- **Thesis Title**: " **Investigation of Heat Input Variations in Directed Energy Deposition of SS316L Using GMAW Processes: A Comparative Study of Cold Metal Transfer and Pulsed MIG**"
- **Courses Completed**:
  1. Research Methodologies and Techniques
  2. Conditioning Monitoring
  3. Lubricant Selection and Application

2. Master of Technology (M.Tech)

Specialization: Mechanical System Design (MSD)
National Institute of Technology, Srinagar
08/2017 – 12/2019

- **CGPA:** **8.40**
- **Thesis Title**: **"Analysis of Corrosion Behaviour of Francis Turbine Blades using Computational Fluid Dynamics (CFD)"**
- **Courses Completed**:
    1. Systematic Design Approach
    2. Finite Element Method
    3. CAD
    4. Design Optimization
    5. Life Cycle Design
    6. Design Against Fatigue
    7. Wear Analysis and Control
    8. Advanced Manufacturing Systems
    9. Design of Tribo-Systems
    10. Advanced Engine Design

3. Bachelor of Technology (B.Tech)

Specialization:
Mechanical Engineering
Shri Mata Vaishno Devi University (SMVDU)
08/2013 – 05/2017

- **CGPA:** **7.31**

4. Higher Secondary (10 + 2)

Math + Medical
Tyndale Biscoe School (TBMS)
09/2009 – 08/2011

- **Percentage:** **93.00%**

Secondary School (10^{th})

Tyndale Biscoe School (TBMS)
08/1998 – 08/2009

- **Percentage:** **93.00%**

3. Research Experience

Senior Research Fellow (SRF), Additive Manufacturing

National Institute of Technology, Srinagar
2022 - 2025

- Led advanced research on pulsed Metal Inert Gas (MIG) and Cold Metal Transfer (CMT) processes derived from Gas Metal Arc Welding (GMAW).
- Developed and implemented single-layer deposition strategies to enhance material integrity and operational efficiency in WAAM applications.
- Optimized printing parameters (heat input, layer height, and wire feed speed) to enhance material properties, reduce porosity, and increase part strength.
- Investigated the microstructural and mechanical properties of stainless steel SS316L in WAAM, focusing on achieving superior weld quality and durability.
- Analyzed wear performance using tungsten carbide (WC) as a counter body for specialized applications.

Junior Research Fellow (JRF), Additive Manufacturing

National Institute of Technology, Srinagar
2019 - 2022

- Collaborated on integrating multi-axis robotic systems to improve precision and flexibility in WAAM for stainless steel parts.
- Developed strategies to enhance deposition efficiency, surface finish, and mechanical properties for stainless steel 316L components.
- Analyzed the microstructure and mechanical properties of stainless steel 316L components using techniques like SEM, XRD, and tensile testing

4. Work Experience

Assistant Professor

Government College of Engineering and Technology (GCET), Safapora, Ganderbal, Jammu and Kashmir
November 2025 – March 2026

Key Responsibilities:

- Deliver undergraduate courses in core mechanical engineering subjects including, Strength of Materials, Fluid Mechanics, Mechanics of Materials, Design of Machine Elements, Thermodynamics, Heat and Mass Transfer and Manufacturing Technology.
- Prepare lesson plans, lecture materials, and assessments aligned with university curriculum.
- Mentor undergraduate students in research activities, and thesis writing, guiding them from problem formulation to final presentation.

Site Engineer
Northern Steel Industries
2019 - 2025

Key Responsibilities:

- Oversaw and managed fabrication operations, including cutting, welding, machining, and assembly of steel structures.
- Reviewed mechanical drawings and coordinated with designers and clients for fabrication feasibility and approvals.
- Collaborated with procurement and logistics teams to ensure timely material availability.

5. Publications

1. Lone, S. F., Rathod, D. W., Nazir Ahmad, S., and Sekar, S. (February 24, 2025). "**Investigating the Tribological Performance and Wear Mechanisms of Stainless Steel 316L in Cold Metal Transfer-Based Wire Arc Additive Manufacturing Under Varied Loads and Thermal Inputs**." ASME. *J. Tribol*. August 2025; 147(8): 084202.
   https://doi.org/10.1115/1.4067810
2. Lone, S.F., Rathod, D.W. & Ahmad, S.N. **Performance Evaluation of Cold Metal Transfer-Based Wire Arc Additive Manufacturing of SS316L: An Effect of Weld Thermal Cycles and Heat Inputs**. *J. of Materi Eng and Perform* (2024). https://doi.org/10.1007/s11665-024-10231-0
3. Lone, S. F., Rathod, D. W., & Ahmad, S. N. (2024). **Exploring the feasibility of SS316L fabrication via CMT-based WAAM: A Comprehensive study on microstructural, mechanical, and tribological properties**. *Mechanical Engineering for Society and Industry*, *4*(2), 237–251.
   https://doi.org/10.31603/mesi.11848.
4. Lone, S.F., Rathod, D.W., Ahmad, S.N. *et al.* **Influence of low heat input on microstructural, mechanical, and corrosion properties in WAAM: a comparative study of cold metal transfer (CMT) and Pulsed MIG techniques**. *Prog Addit Manuf* (2025).
   https://doi.org/10.1007/s40964-025-01188-0
5. Lone, S. F., Rathod, D. W., and Nazir Ahmad, S. (July 14, 2025). "**Impact of Cold Metal Transfer and Pulse Multi-Control Heat Inputs on SS316L Wire Arc Additively Manufactured Built-up Properties and Performance**." ASME. *J. Eng. Mater. Technol*
   https://doi.org/10.1115/1.4069165
6. Lone, S.F., Rathod, D.W. & Ahmad, **"A Comprehensive Review: Toward Smarter WAAM – Materials, Challenges, and AI-Driven Quality Enhancements"** *Advances in Materials and Processing Technologies, Taylor and Francis*
   (Major Revision Submitted.)

7. Lone, S.F. "**Advancements in Pulsed GMAW-Based WAAM for Fabricating High-Quality SS316L Structures with Tailored Properties**" *Journal of Industrial Lubrication and Tribology, Emerald Publishing. (Under Review)*

6. Patents

- Title of the Invention: **Handheld Cleaning Apparatus with Capillary Action**
- Application No: 202511058022 A
- Date of filing of Application: 17/06/2025
- Publication Date: 04/07/2025
- International Classification: A47L0005240000, A47L0007000000, A47L0009000000, A47L0009100000, G06F0001200000

7. International Conferences

International Conference on Advanced Materials for Sustainable Future (ICAMSF-2025), on 28 -29 March 2025, organized by Centre for Research Impact and Outcome (CRIO), Chitkara University, Punjab, India.

8. Projects

- **Analysis of Corrosion Behaviour of Blades of Francis Turbine.**
- **Fabrication and Optimization of Silica-Based Dehumidifier.**
- **Fabrication of a Working Prototype of Radial Engine.**
- **Upgradation of the Drainage Pumping Station in Srinagar City.**

9. Competitive Exams

JEE (2012)	**147 Points**
GATE (2017)	**52 Points**
Ph.D. Entrance Exam	**Qualified**

10. Skills

- **Mechanical Design & Analysis:** Proficient in CAD tools (AutoCAD, SolidWorks).
- **Welding Techniques:** Expertise in Gas Metal Arc Welding (GMAW), Cold Metal Transfer (CMT), Pulsed Metal Inert Gas (P-MIG) welding Techniques.
- **Additive Manufacturing:** Expertise in Wire Arc Additive Manufacturing (WAAM), including process optimization, defect analysis, and material characterization.
- **Materials Characterization:** Field Emission Scanning Electron Microscope (FESEM), X-Ray Diffractometry (XRD)
- **Simulation & Modelling:** Experienced in simulations and fluid dynamics analysis using FEA software (ANSYS)

- **Robot Handling:** Expertise in handling multi-axis robots.
- **Microsoft Office Suite:** Expertise in the Microsoft Office Suite, including Word, Excel, and PowerPoint.
- **Data Analysis Tools:** Proficient in data analysis tools, including Origin 2024b, Microsoft Excel, MATLAB

11. Certifications

- "Master's in SolidWorks" Certification by LinkedIn Learning.
- “3D Printing” Certification by LinkedIn Learning.
- “Advances in Material Characterization and Data Processing” Certification by Anurag University.
- “Enhancing Skill of Technical Writing and Presentation” Certification by the National Institute of Technology (NIT), Kurukshetra.
- “Intellectual Property Management at Early Innovations and Startups” Certification by National Institute of Technology (NIT), Srinagar
- “Biomedical Devices: Design and Manufacturing” Certification by the National Institute of Technology (NIT), Srinagar.
- "Electric Vehicles" Certification by DelftX University.
- “Electric Vehicles” Certification by KPIT Sparkle.
- "Masters of Microsoft Word" Certification by Udemy.
- “Geopolymer Concrete- Materials, Methods, Properties and Applications” Certification by the Indian Concrete Institute.
- Economic Reconstruction Agency (ERA) Certification of Internship in Drainage Pumping Station Upgradation in Srinagar City.
- "Google Docs" Certification by Coursera.
- “Building an Ethereum Blockchain App” Certification by LinkedIn Learning
- All India University (AIU) Certification for Cricket League.

12. References

1. **Prof. Sheikh Nazir Ahmad - Professor**
   National Institute of Technology, Srinagar
   nazir@nitsri.net | 7006629047
2. **Prof. (HAG) G.A. Harmain - Professor**
   National Institute of Technology, Srinagar
   gharmain@nitsri.ac.in
3. **Dr. Dinesh W. Rathod - Associate Professor**
   National Institute of Technology, Kurukshetra.
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