Dr. Bipin Kumar Chaurasia

Curriculum Vitae

Ph.D. Mechanical Engineering | R&D Manager | Safety & Rescue Systems Specialist

Ahmedabad, Gujarat | India

Contact Information

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Location: Ahmedabad, Gujarat, India

Affiliation: Indian Inovatix Limited, R&D Department

Professional Summary

Mechanical Engineer and researcher with Ph.D.-level expertise in composite materials, impact dynamics, damage mechanics, and structural design, complemented by industrial R&D management experience in safety and rescue systems. Currently working as an R&D Manager at Indian Inovatix Limited (Ahmedabad, since 5 January 2024) with responsibility for magnetic braking systems, emergency escape devices, and fall-arrest solutions for high-risk environments. Track record includes SCI/SCIE publications, a granted design patent, funded projects, and extensive postgraduate teaching assistance across mechanical engineering laboratories. Based in Ahmedabad with active research collaborations in multifunctional composites and impact dynamics.

Core Expertise

- Composite materials and damage mechanics
- High strain rate and impact modelling of laminated composites
- Magnetic brake and eddy-current braking systems
- Emergency escape, rescue, and fall-arrest device design
- Structural and mechanical design validation
- COMSOL Multiphysics, ANSYS, ABAQUS-based finite element analysis
- CAD/CAM, engineering drawings, and product development
- Research collaboration and interdisciplinary engineering

Professional Experience

R&D Manager

Indian Inovatix Limited | 5 Jan 2024 – Present

- Lead R&D activities and product development for magnetic braking systems, emergency escape devices, and fall-arrest solutions for high-risk industrial environments
- Manage cross-functional teams across design, testing, certification, and deployment of safety-critical systems
- Oversee COMSOL Multiphysics and FEA-based electromagnetic and structural validation of braking and safety devices
- Develop product roadmaps and technical specifications for next-generation safety systems
- Collaborate with academic partners (Ahmedabad University) and industrial stakeholders for advanced research and commercialization

R&D Engineer

Indian Inovatix Limited | Jan 2023 – 4 Jan 2024

- Designed and developed magnetic braking systems using Samarium–Cobalt permanent magnets for safety and rescue applications
- Executed COMSOL Multiphysics simulations for coupled electromagnetic and structural response validation of braking and safety devices
- Developed Top Man Emergency Escape Devices, confined-space safety systems, and fall-arrest solutions compliant with industrial safety standards
- Performed prototype testing and validation of safety-critical systems for high-risk industrial environments
- Collaborated cross-functionally with design, testing, and compliance teams for product certification

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Academic Qualifications

Ph.D. in Mechanical Engineering

National Institute of Technology Jamshedpur, India | 2023 | CGPA: 8.00

Thesis: Modelling of Laminated Composite Under High Strain Rate Loading

Advisors: Dr. Deepak Kumar and Prof. M. K. Paswan

Research Focus: High-strain-rate impact dynamics, damage evolution mechanisms, and numerical modelling of advanced composite structures

M.Tech. in Mechanical Engineering (Polymer Composites & Tribology)

National Institute of Technology Rourkela, India | 2018 | CGPA: 8.70

Thesis: Mechanical and Tribological Behavior of Eulaliopsis Binate (Short Fiber) Reinforced Epoxy Polymer Composite

Supervisor: Prof. Samir Kumar Acharya

B.Tech. in Mechanical Engineering

Gandhi Engineering College, BPUT, India | 2015 | CGPA: 8.18

Teaching and Academic Experience

- Strength of Materials Lab – NIT Jamshedpur (4 years, Research Scholar)
- CAD/CAM Lab – NIT Jamshedpur (4 years, Research Scholar)
- ANSYS Lab – M.Tech. level (2 years)
- Tribology Lab – NIT Rourkela (1 year)
- Engineering Drawing – B.Tech. level (1 year)

Research Interests

- Micromechanics and failure of composite materials
- Damage and fracture mechanics in advanced laminates
- Multifunctional and hybrid composites for impact mitigation
- High strain rate loading and impact dynamics
- Structural design and CAD/CAM-based product development
- Safety systems design and validation
- Materials for aerospace and defense applications

Software and Technical Skills

- **Finite Element Analysis:** COMSOL Multiphysics, ANSYS, ABAQUS
- **CAD Software:** SolidWorks, CATIA V5, AutoCAD
- **Programming and Analysis:** MATLAB, Fortran
- **Design and Simulation:** Product design, electromagnetic simulation, structural validation

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Major Projects

1. Development of Food Wastage Recycler Machine – Sponsored by National Institute of Design (NID), Ministry of Education, Government of India. Developed prototype with waste segregation and processing capabilities.
2. Portable Ball Milling Machine – Design patent granted (Application No: 356784-001). Engineered cost-effective grinding solution with improved efficiency and portability.
3. Aluminium Riveted Joint Analysis – Experimental and numerical investigations for failure prediction and load capacity assessment in aerospace applications.
4. High Strain Rate Modelling of CFRP Composite – Dynamic compressive loading analysis and damage evolution mechanisms (Ph.D. thesis work) using

ANSYS/ABAQUS.
5. Design and Structural Analysis of C-shaped Hybrid Laminates – International collaborative project with Gyeongsang National University, Jinju, South Korea. Explored novel laminate geometries for improved performance.
6. Development of cost-effective front and rear axle for 12–14 ton load-carrying vehicle – Industrial collaboration with RSB Transmission (I) Ltd., Jamshedpur. Reduced material costs while maintaining structural integrity.

Patents and Intellectual Property

- Portable Ball Milling Machine – Design Patent Granted (Application No: 356784-001)

Publications

Book Chapters

1. Chaurasia, B.K., Kumar, D., & Acharya, S.K. Investigation of failure in L-shaped woven carbon fiber-reinforced polymer composite under pull-out and four-point bending. In *Recent Advances in Manufacturing, Automation, Design and Energy Technologies*, pp. 693–703. Springer, Singapore, 2022.
2. Chaurasia, B.K., Kumar, D., & Roy, R. Damage studies in curved hybrid laminates under pull-out loading. In *Advance Composite Material and Structures: Modeling and Analysis*. (In press)

Peer-Reviewed Journal Publications

1. Chaurasia, B.K., Kumar, D., & Paswan, M.K. (2022). Experimental studies of failure in L-shaped carbon fiber-reinforced polymer composite under pullout and four-point bending. *Journal of The Institution of Engineers (India) Series D*, 103, 889–897. https://doi.org/10.1007/s40033-022-00411-4
2. Haque, S.A., Ghosh, I., Chaurasia, B.K., & Paswan, M.K. (2023). Water immersion test and its effect on the mechanical behavior of reinforced natural fiber composites. *Annals of the Bhandarkar Oriental Research Institute*, 104(7), 45–62. ISSN: 0378-1143

International and National Conference Presentations

1. Chaurasia, B.K., & Kumar, D. (2020). Damage interaction in carbon fibre reinforced polymer laminates under in-plane loading. In *Proceedings of ICCS23+MECHCOMP6 (International Conference)*, September 2, 2020.
2. Chaurasia, B.K., & Kumar, D. (2020). Delamination and matrix cracking in curved glass fibre composite under quasi-static load. In *Proceedings of ICCS23+MECHCOMP6 (International Conference)*, September 2, 2020.
3. Chaurasia, B.K., & Kumar, D. (2021). Modeling of damage evolution of laminated composites under high strain rate loading. In *Proceedings of ICTACEM 2021 (International Conference)*, December 20–22, 2021.
4. Chaurasia, B.K., & Kumar, D. (2022). High strain rate modeling of CFRP composite under compressive loading. In *Proceedings of INCAM 2022 (National Conference)*, November 11–15, 2022.
5. Chaurasia, B.K., & Kumar, D. (2022). Investigation of failure load in riveted lap joints made of aluminum alloys. In *Proceedings of INCAM 2022 (National Conference)*,

November 11–15, 2022.
6. Chaurasia, B.K. (2023). Comparison and evaluation of physical properties of short fiber composite and particulate composite. In *Proceedings of ICERPSD 2023 (International Conference)*, May 27–28, 2023.

Papers Under Review

1. Chaurasia, B.K., Kumar, D., & Paswan, M.K. Damage interaction in carbon fiber reinforced polymer laminates under in-plane loading. *Composite Structures* (SCI).
2. Chaurasia, B.K., Kumar, D., & Paswan, M.K. Damage analysis of L-shaped glass fiber composite under four-point quasi-static loading. *Fibers and Polymers* (SCIE/SSCI).
3. Chaurasia, B.K., Kumar, D., & Paswan, M.K. Dynamic compressive impact behavior of CFRP composite under high strain rate loading. *Part C: Journal of Mechanical Engineering Science* (ESCI).
4. Chaurasia, B.K., Kumar, D., & Paswan, M.K. Modeling of damage evolution of laminated composites under high strain rate loading. *Composite Part B: Engineering* (SCI).
5. Chaurasia, B.K., Kumar, D., & Paswan, M.K. Delamination and matrix cracking in L-shaped randomly oriented glass fiber composite laminate under quasi-static load. *Materials Today Communications* (SCIE).
6. Chaurasia, B.K., Kumar, D., & Paswan, M.K. FE analysis of CFRP composite for damage evolution under high strain rate compressive modeling. (Submitted)

Professional Memberships

- Indian Society for Applied Mechanics (ISAM)

Languages

- English (Professional fluency)
- Hindi (Native language)

Additional Information

Hobbies & Interests: Trekking, climbing, outdoor recreation, technical writing, mechanical innovation

Availability for Collaboration: Open to research partnerships, consulting projects, and faculty positions in mechanical engineering, composite materials, and safety systems design.

Declaration

I hereby declare that the above information is true and correct to the best of my knowledge and belief. The credentials, experience, and publications mentioned are authentic and accurate.

Signature: _____ **Date:** _____

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