




Dr. Bipin Kumar Chaurasia


Ph.D. Mechanical Engineering | R&D Manager

Safety & Rescue Systems Specialist


CONTACT INFORMATION

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 **Affiliation:** Indian Inovatix Limited, R&D Dept.

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PROFESSIONAL SUMMARY

Accomplished Mechanical Engineer and researcher with Ph.D.-level expertise in composite materials, impact dynamics, damage mechanics, and structural design. Currently serving as R&D Manager at Indian Inovatix Limited, Ahmedabad (since January 2024), leading development of magnetic braking systems, emergency escape devices, and fall-arrest solutions for high-risk industrial environments. Demonstrated excellence through peer-reviewed SCI/SCIE publications, a granted design patent, successful funded projects, and extensive postgraduate teaching experience. Strong foundation in multifunctional composites, finite element analysis, and safety-critical product development with active research collaborations.

CORE EXPERTISE

- Composite Materials & Damage Mechanics
- High Strain Rate & Impact Modeling
- Magnetic Brake & Eddy-Current Systems
- Emergency Escape & Fall-Arrest Devices
- FEA (COMSOL, ANSYS, ABAQUS)
- CAD/CAM & Product Development
- Structural Design & Validation
- Research Collaboration & Leadership

PROFESSIONAL EXPERIENCE

R&D Manager

Indian Inovatix Limited | January 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

Postdoctoral Fellow

School of Engineering and Applied Sciences, Ahmedabad University | January 2023 – January 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
- 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

EDUCATION

Ph.D. in Mechanical Engineering | CGPA: 8.00

National Institute of Technology Jamshedpur, India | 2023

Thesis: Modelling of Laminated Composite Under High Strain Rate Loading

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

M.Tech. in Mechanical Engineering (Polymer Composites & Tribology) | CGPA: 8.70

National Institute of Technology Rourkela, India | 2018

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

B.Tech. in Mechanical Engineering | CGPA: 8.18

Gandhi Engineering College, BPUT, India | 2015

TEACHING & ACADEMIC EXPERIENCE

- PDF in school of engineering and applied science
- Assistant professor in Vardhman college of engineering
- 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 & Failure of Composites
- Damage & Fracture Mechanics
- Multifunctional Hybrid Composites
- High Strain Rate & Impact Dynamics
- Structural Design & CAD/CAM
- Safety Systems Design & Validation
- Materials for Aerospace & Defense

TECHNICAL SKILLS & SOFTWARE

FEA Tools:	COMSOL Multiphysics, ANSYS, ABAQUS
CAD Software:	SolidWorks, CATIA V5, AutoCAD
Programming:	MATLAB, Fortran
Specializations:	Product Design, Electromagnetic Simulation, Structural Validation

MAJOR PROJECTS

1. 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 using ANSYS/ABAQUS (Ph.D. thesis work).

5. C-shaped Hybrid Laminates Design

International collaborative project with Gyeongsang National University, Jinju, South Korea. Explored novel laminate geometries for improved performance.

6. Cost-Effective Axle Development

Industrial collaboration with RSB Transmission (I) Ltd., Jamshedpur. Developed front and rear axle for 12–14 ton load-carrying vehicles with reduced material costs while maintaining structural integrity.

PATENTS & 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

Conference Presentations (Selected)

1. *Damage interaction in carbon fibre reinforced polymer laminates under in-plane loading*. ICCS23+MECHCOMP6, September 2020.
2. *Modeling of damage evolution of laminated composites under high strain rate loading*. ICTACEM 2021, December 2021.
3. *High strain rate modeling of CFRP composite under compressive loading*. INCAM 2022, November 2022.
4. *Investigation of failure load in riveted lap joints made of aluminum alloys*. INCAM 2022, November 2022.
5. *Comparison and evaluation of physical properties of short fiber composite and particulate composite*. ICERPSD 2023, May 2023.

Papers Under Review

- Damage interaction in carbon fiber reinforced polymer laminates under in-plane loading – Composite Structures (SCI)
- Damage analysis of L-shaped glass fiber composite under four-point quasi-static loading – Fibers and Polymers (SCIE/SSCI)
- Dynamic compressive impact behavior of CFRP composite under high strain rate loading – Part C: Journal of Mechanical Engineering Science (ESCI)
- Modeling of damage evolution of laminated composites under high strain rate loading – Composite Part B: Engineering (SCI)
- Delamination and matrix cracking in L-shaped randomly oriented glass fiber composite laminate under quasi-static load – Materials Today Communications (SCIE)

PROFESSIONAL MEMBERSHIPS

- Indian Society for Applied Mechanics (ISAM)