

Mahesh

Experienced in fabrication, mechanical testing and damage evaluation of fibre reinforced polymer composite laminates and metal matrix composites.

Work Experience

- **Institute Postdoctoral Fellow (27th March, 2023 to till date)** in the Department of Aerospace Engineering, Indian Institute of Technology Madras, Chennai, Tamil Nadu, India. My postdoctoral research involves the development of fabrication process for metal and ceramic matrix composites for high velocity impact applications using biomimicry concepts.
 - **Project Assistant (1st July 2022 to 25th March 2023)** in the Department of Mechanical Engineering, Indian Institute of Technology (Indian School of Mines) Dhanbad, Jharkhand, India. Here, I was involved in a project entitled "*Design and development of knee and spinal smart protective devices for improving the health and safety of miners*". My role was on designing, fabrication and testing of knee and spinal protective equipment.
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Education

- **PhD** in Mechanical Engineering from **Indian Institute of Technology Dhanbad**, Jharkhand, India.
CGPA: 7.2/10 (First division)
Thesis title: *Impact damage analysis of symmetric GFRP and CFRP composite laminates*
Supervisor: Dr. Kalyan Kumar Singh, Department of Mechanical Engineering, Indian Institute of Technology (Indian School of Mines) Dhanbad, Jharkhand, India
Academic Year: March, 2017 to January, 2023
- **Master of Technology** (specialisation: **Computer Integrated Manufacturing**) in Mechanical Engineering from **M. S. Ramaiah Institute of Technology**, Bangalore, Karnataka, India.
CGPA: 9.4/10 (First division)
Thesis title: *Modelling and analysis of strengthening mechanism in CNT reinforced copper composites using shear lag model*

Supervisor: Dr. Vishwanath Koti, Department of Mechanical Engineering, M. S. Ramaiah Institute of Technology, Bangalore, Karnataka, India

Academic Year: 2014 to 2016

- **Bachelor of Engineering** in Mechanical from **J. S. S. Academy of Technical Education**, Bangalore, Karnataka, India
Percentage: 70.12% (First division)
Project: *Increasing the efficiency of Dual Fuel engine by using turbocharger with rice brain oil and coconut shell as fuel*
Academic year: 2010 to 2014
 - **Pre-university course in science (10+2)** from Shree Guru Independent PU College of Science, Gulbarga, Karnataka, India
Percentage: 81.5% (First division)
Academic year: 2008-2010
 - **High school (10th standard)** from Govt. Junior College, Chincholi, Gulbarga, Karnataka, India
Percentage: 84.64% (First division)
Academic Year: 2008
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Research Interests

- Fabrication, mechanical testing and damage analysis of fibre reinforced polymer composites, metal matrix composites, and Ceramic matrix composites
 - Biomimicry
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Summary of Academic Research Publications

- Number of monograph books published – 1
 - Number of articles published in SCI indexed journals – 9
 - Number of articles/book chapters published in SCOPUS indexed journals – 5
 - Link to Google scholar profile -
https://scholar.google.co.in/citations?user=g0e_esMAAAAJ&hl=en
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Detailed Publication List

Book

1. Singh KK, **Mahesh**. *Impact Behavior of Fibre Reinforced Laminates: Fundamentals of Low Velocity Impact and Related Literature on FRP*. **Springer Nature**; 2022.
<https://link.springer.com/book/10.1007/978-981-16-9439-4>

Publications in SCI/SCIE/ESCI Indexed Journals

1. Singh KK, **Mahesh***. "Effect of ply position switching in quasi-isotropic glass fibre reinforced polymer composite subjected to low velocity impact" *International Journal of Damage Mechanics* 2022;31:665–93. <https://doi.org/10.1177%2F10567895211068176>
2. **Mahesh**, Rawat P, Sai L, Behera RP, Singh KK, Zhu D. "Shear performance of MWCNTs modified single-lap joints of glass/epoxy laminates" *Journal of Adhesion of Science and Technology* 2021:1–20. <https://doi.org/10.1080/01694243.2021.2011825>
3. Pavan G, Singh KK, **Mahesh***. "Elevated thermal conditioning effect on flexural strength of GFRP laminates: An experimental and statistical approach" *Materials Today Communications* 2020:101809. <https://doi.org/10.1016/j.mtcomm.2020.101809>
4. Pavan G, Singh KK, **Mahesh***. "Influence of Loading Direction on Impact Strength and Small Span Length Variation on Flexural Strength in GFRP Laminate" *Journal of Testing and Evaluation* 2021;49:3460–81. <https://www.astm.org/jte20200395.html>
5. **Mahesh**, Koti V, Singh KK, Singh RK. "Experimental and statistical investigation on the wear and hardness behaviour of multiwalled carbon nanotubes reinforced copper nanocomposites" *Wear* 2022;500–501:204368. <https://doi.org/10.1016/j.wear.2022.204368>
6. **Shindhe M**, Rawat P, Singh NK. "A finite element analysis on the ballistic impact performance of two-layered laminate design inspired by teleost fish scales" *International Journal of Interactive Design and Manufacturing* 2023.
7. Rawat P, Sai L, **Mahesh***, Kumar R, Singh NK. "Numerical Investigation on the High-Velocity Impact Resistance of Textile Reinforced Composite Mesh Designs Inspired by Spider Web" *The Journal of The Textile Institute* 2023.
8. Singh RK, **Shindhe M***, Rawat P, Srivastava AK, Singh GK, Verma R, Bhutto JK, Hussein HS. "The effect of various contaminants on the surface tribological properties of rail and wheel materials: An experimental approach" *Coatings* 2023;13(3):560. <https://doi.org/10.3390/coatings13030560>
9. Koti V, **Mahesh***, Murthy KVS, Koppad PG, Sethuram D. "Hardness and electrical conductivity of uncoated and silver coated carbon nanotubes reinforced copper nanocomposites" *Sādhanā* 2022;47:179. <https://doi.org/10.1007/s12046-022-01949-5>

Publications in SCOPUS Indexed Journals

1. **Mahesh**, Singh KK, Koti V, Rawat P. "Dependence of secondary operations in powder metallurgy and their impact on the electrical conductivity of MWCNTs/Cu

nanocomposites" *Materials Today Proceedings* 2021.

<https://doi.org/10.1016/j.matpr.2021.08.329>

2. **Mahesh**, Rawat P, Singh KK, Singh PK. "Comparison of steel and fiber-reinforced polymer rebars for mining applications: A numerical approach" *Materials Today Proceedings* 2020;33:5041–5. <https://doi.org/10.1016/j.matpr.2020.02.840>
3. **Mahesh**, Singh KK. "In-Plane Low Velocity Impact Behavior of GFRP Laminate" *Materials Science Forum*, vol. 978, Trans Tech Publ; 2020, p. 257–63. <https://doi.org/10.4028/www.scientific.net/MSF.978.257>
4. **Mahesh**, Singh KK. "Influence of Varying Fully Constrained Circular Boundary Condition Area on Damage Mechanism of GFRP Laminate Under Low Velocity Impact Loading" BT - Advances in Computational Methods in Manufacturing. In: Narayanan RG, Joshi SN, Dixit US, editors., Singapore: Springer Singapore; 2019, p. 1011–21. https://doi.org/10.1007/978-981-32-9072-3_85
5. **Mahesh**, Singh KK. "Numerical Simulation of GFRP Laminate Under Low-Velocity Impact at Different Edge-Constrained Boundary Conditions" BT - Trends in Materials Engineering. In: Singh I, Bajpai PK, Panwar K, editors., Singapore: Springer Singapore; 2019, p. 87–95. https://doi.org/10.1007/978-981-13-9016-6_10

Manuscripts (accepted/under review/submitted)

1. **Mahesh**, Kumar S, Singh KK, Rawat P. "Effect of Time Step Scale Factor Value on the Low Velocity Impact Numerical Simulation Results in LS-DYNA" **[Accepted, 2023]**
2. Rai S, **Mahesh**, Rawat P. "Numerical Simulation Approach for Low-Velocity Impacts Response of Bioinspired layup design in GFRP Laminates" **[Revision submitted, 2023]**
3. Thakur RK, Singh KK, **Mahesh***, Rawat P. "Evaluation of Graphene Nanoplatelets Effect on Hole Quality and Bearing Strength of Glass and Carbon Fibre Reinforced Epoxy Laminates" **[Comments received, 2023]**
4. **Mahesh**, Singh KK, Prashant Rawat "Effect of $(0^0/90^0)$ and $(+45^0/-45^0)$ Plies on the Failure Modes in Carbon Fibre Reinforced Polymer Composite Laminates Under Quasi-Static Tensile Loading" **Comments received, 2023]**
5. Swaroop PK, Rawat P, **Mahesh**. "Bio-inspired Design Concepts for Tailoring the Flexural and Shear Strength Properties of Glass Fiber/Epoxy Composite Laminates" **[Under review, 2023]**

6. Kousar J, **Mahesh**, Sivasubramanian PD, Kumar D, Chiang CH, Shih YF. "A review on the real-time structural health monitoring of aircraft structures using carbon-based nanomaterials: Present trends and future prospects" **[Manuscript submitted, 2023]**
 7. Singh KK, **Mahesh***, Harshvardhan L, Roy N, Mandal N, Mishra DD. "In-situ Health Monitoring of Glass Fibre fiber-reinforced polymer Composite Rock Bolts by Artificial Neural Network and Piezoelectric Ceramic Sensor for Coal Mines Application" **[Manuscript submitted, 2023]**
 8. Varsha MP, **Mahesh**, Rawat P. "Axial Compression Behavior of Aluminum (Al), Glass/Epoxy (GFRP) and Hybrid Al-GFRP Crash-box: An Experimental and Digital Image Correlation Approach" **[Manuscript submitted, 2023]**
 9. Kumar S, Rawat P, **Mahesh**. "Effect of Elevated Thermal Conditioning on the Interlaminar Shear Strength Properties of Post Cured Flax/Epoxy laminates" **[Manuscript submitted, 2023]**
 10. **Mahesh**, Singh KK, Koti V, Siddaraju C, Basavaraja BM, Rawat P. "Electrical Conductivity Measurement of Multiwalled Carbon Nanotubes Reinforced Copper Nanocomposites at Elevated Temperatures Using Experimental and Artificial Neural Network Techniques" **[Manuscript submitted, 2023]**
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