

Curriculum Vitae of
Professor Bishakh Bhattacharya
HAG Professor



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1. Personal Details

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Kanpur 208016, India**

Date of Birth: 14.09.1967

Nationality: Indian

Marital Status: Married with two children

Orcid: <https://orcid.org/0000-0002-9621-5246>

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Facebook: <https://www.facebook.com/public/Bishakh-Bhattacharya>

ResearchGate: <https://www.researchgate.net/profile/Bishakh-Bhattacharya>

2. Education

Ph.D. (1998), Department of Aerospace Engineering, Indian Institute of Science Bangalore

- Thesis Title: Vibration Suppression of Smart Laminated Composite Beams and Plates
- Advisors: Professors A. V. Krishnamurthy and M. S. Bhat
- Area of Study: Control-Structure Interaction in Smart Structures

M. E. (1991), Department of Mechanical Engineering, Jadavpur University, Calcutta

- Thesis Title: Finite Element Analysis of Axisymmetric Structures under Non-axisymmetric Loading
- Advisor: Professor Abhijit Datta
- Area of Study: Applied Mechanics

B. E. (1988), Department of Civil Engineering, Jadavpur University, Calcutta

- Project Title: Finite Element Analysis and Design of Portal Structures

3. Professional/Research Experience

2020 - Continuing: HAG Professor in the Department of Mechanical Engineering, IIT Kanpur

2020-2023: HAL Chair Professor in the Department of Mechanical Engineering, IIT Kanpur

2012 – 2020: Professor in the Department of Mechanical Engineering, IIT Kanpur

2008-2011: Associate Professor in the Department of Mechanical Engineering, IIT-Kanpur.

2000-2007: Assistant Professor in the Department of Mechanical Engineering, IIT-Kanpur.

2002-2020: Joint Faculty, Design Department, IIT-Kanpur.

2015-2020: Joint Faculty, Cognitive Science Department, IIT-Kanpur.

1997-2000: Research Associate in the Rolls Royce UTC, Department of Mechanical Engineering, University of Sheffield, project funded by DERA (Defense Evaluation and Research Agency), UK on Dynamic Analysis & Performance Estimation of Energy Absorbing Composite Joints.

1994-1997: Project Associate in AR & DB (Aeronautical Research and Development Board) sponsored project for the study of Vibration Suppression Feasibilities in Laminated Composite Plates, in the Aerospace Engineering Department, Indian Institute of Science, Bangalore.

1991-1992: Assistant Engineer, EMC SteelAl Limited, Calcutta, India; in the Structural Analysis and Design of Transmission Tower (EHV) Lines.

1988-1989: Engineer Trainee, Simplex Concrete Piles (I) Ltd, Calcutta, India, in the Design and Construction of Turbo Generator Deck for two 500 MW thermal power stations at Chandrapur Super Thermal Power Station, Maharashtra, India.

3.1 Teaching Experience

2000-: Department of Mechanical Engineering, IIT-Kanpur;

Courses Taken:

As Instructor	As Tutor
Applied Dynamics & Vibration	Engineering Dynamics
Automation & Control	Engineering Graphics
Composite Materials	Design of Machine Element

Dynamics & Control of Machines	Technical Communication Skill
Dynamics & Control of Robotic Manipulator	Coordinator of UG Projects
Integrated Product Development	Vibration & Control Laboratory
Material Selection in Mechanical Design	Experimental Stress Analysis Laboratory
Mechatronics	
Nature and Properties of Material	
Material Selection in Mechanical Design	
Smart Materials and Structures	
Vibration and Control	

2002-: Design Programme, IIT-Kanpur, Courses taken:

As Instructor	As Tutor
Design Practice	Design Projects on Embedded System
Design Projects on Embedded System Design	New Product Development
Intelligent Product Design	
New Product Development	
Topics in Design [Design Research & Axiomatic Design]	

4. Details of M Tech (82), MS (4), M Des (28) and PhD (17) Thesis Supervision

M Tech Thesis [82]:
[2024]

1. Soumyajyoti Sarkar: *Variable Cross-section Meta Beam for Enhanced Bandgaps*
2. Tom Baby: Autonomous Navigation of 4WIS4WID Agricultural Field Mobile Robot using Deep Reinforcement Learning

[2023]:

1. Garima Pal: *Study of Child Robot Interaction using NAO Robot*
2. Ashish Garg: *Development of vision-based robotics for agriculture activities*
3. N. Azhar: *Multiphysics Based Simulation and Analysis of an Enhanced Phenomenological Model of Shape Memory Alloy Wire in COMSOL*
4. Soumodip Sarkar: *Studies on bandgap in a cantilever metabeam including the effect of damping*

[2022]:

5. Ratnangshu Das: *Experimental Study and Modelling of Trust in Child Robot Interaction*
6. Ravi Kumar Sah: *Design and Development of Agriculture Robot Integrated with Robotic Arm for Pest Control*

[2021]

7. S. Aswin: *Numerical and experimental investigation of vibration attenuation in meta-sandwich beam with addition of mass resonators*

[2020]

8. Anurag Kumar Dwivedi: *Study of Phase Response Synchronization in Neuronal Population using Fractional Kuramoto Model*
9. Ranjeet Kumar: *Experimental investigation of natural frequency of the Shape Memory Alloy embedded composite*
10. Amanpreet Singh: *Metamaterial inspired tensairity beam for vibration attenuation*

[2019]

11. Ishan Pande, *Modeling Neurons as Kuramoto Oscillators*
12. Akshat Rastogi: *Development of piezo-based energy harvesting from the vortex induced vibration of a cantilever beam in water flow*
13. Ashish Goel: *Analysis and Design of Piezoelectric Fuel Injection System*
14. Asif Siddiqui: *Design and analysis of air foil bearing for micro gas turbine engine*

[2018]

15. Abhinav Ranjan: *Design and Development of Assisted Thyroid Retractor*

16. Ayush Poddar: *Design and Development of Modular Pipeline Inspection Crawling Robot*
17. Sachin Umrao: *Structural Health Monitoring of Gas-Pipe Network Based on Machine Learning Techniques*
18. Jai Prakash Singh: *Analytical study of Active and Smart Cabin Pressure Control System for variable flight profile*
19. Abhishek Kumar: *Design of Eddy Current Damped Boring Bars*
20. Sanjay Singh Verma: *Modelling of a Cantilever Beam Probe for Inspection of Defects on the Inner Surface of Pipe integrated with PVDF Sensor*

[2017]

21. Shubham Kumar: *Design and development of active smart stick system for elderly people*
22. Dhruval Shah: *Designing a Smart Stick for Elderly with continuous assistance during Sit-To-Stand transfer*

[2016]

23. Shubham Agarwal: *Modeling and System Identification of Viscoelastic Material and Inflated Structure using Frequency Response Transmissibility*
24. Hanit Bansal: *Design and development of a modified eddy current damper for improved high frequency isolation*
25. Kanhaiya Lal Chaurasia: *A Novel and Robust Cabin Pressure Control System (CPCS) for Combat Aircraft using Active Smart Valve System*

[2015]

26. Matin Ahmed: *Gas Path Simulation and Fault Diagnosis Model for an Aero Engine Gas Turbine*
27. Sharad Katiyar: *Modelling of the Electro-Thermo-Mechanical behaviour in a laminated composite beam with externally attached SMA actuator and its application in delamination detection*
28. Anirudhdha A Kulkarni: *Vibration transmissibility based identification of viscoelastic systems*
29. Anil K Meena: *Identification of mechanical system through impulse excitation*

30. Vaibhav Verma: *Design and development of pipe health monitoring robot*
31. Ajinkya Jain: *Two design challenges in exoskeleton system: optimal gait control and optimal gripper system design*

[2014]

32. Shikhar Pradhan: *Analysis and Design Optimization of a Seven Link Robot Gripper with an Integrated Actuation System.*
33. Vaibhav Chaturvedi: *Optimal Design of Smart Stiffener for Vibration Damping of a Parabolic Space Antenna*
34. Ajay K Jain: *Shape Memory Alloy (SMA) based Sensor for Two-Phase Flows*
35. Akshay Chawla: *Optimal Actuation of SMA-wire Network for Adaptive Shape Control of a Space Antenna System*

[2013]

36. Praveen D Kumar: *Active shape control of parabolic antenna using shape memory alloy wires.*
37. Partha Pratim Paul: *Development of a Coupled Thermo-Electro Mechanical and Temporal Model of SMA Wire using a Hybrid approach.*
38. Anmol Pandey: *Topology Optimization of Compliant Systems using Constructive Solid Geometry through Multi-objective Genetic Algorithm.*

[2012]

39. Chetan Ingale: *Design of a Passive Vibration Isolation System using Magnetic Damper.*
40. Gokul Khairnar: *Damage identification in composite structures using dynamic response and machine learning techniques.*
41. Shriram Kulkarni: *Muscle powered piezoelectric energy harvesting system for implantable medical devices.*
42. Nitesh Kurmar Shah: *Investigation of Damping in Viscoelastic Nanocomposite for Large Frequency Band.*

43. Faez Ahmed: *Topology Optimization of Compliant Systems using Constructive Solid Geometry.*

44. Dipak Kumhar: *Dynamic Response based Damage Detection in Turbine Blades.*

[2011]

45. Ramchandra Lad: *Studies on the Active Shape Control of Parabolic Antenna Model Using Shape Memory Alloy (SMA) Wire based Actuators.*

46. Saurabh Agrawal: *Studies on Damage Detection in Laminated Composite Structure Based on Dynamic Response Analysis.*

47. Nitish Kumar: *Studies on Friction Induced Oscillations of Disc Brake Idealized as Cantilever Beam with End Mass in Contact with Rotating Disk.*

48. Subhash Yadav: *Modelling and Development of broad band damping layer for flexible links.*

[2010]

49. Satish Satpal: *Development of passive vibration isolation device using Shape Memory Alloy (SMA) wire.*

50. Prashant Kumar: *Application of 3D Laser Doppler Vibrometer for Damage Detection in Composite Plates.*

51. Shashank S Pande: *Analysis and Control of Friction Induced Oscillations in an idealized Brake Model.*

[2009]

52. Sudhir Varanasi: *Finite element Model updating for Damage detection and Damping Identification in Composites using Dynamic Responses from Laser Scanning Doppler Vibrometer.*

53. Lalit Lahuti: *Partially compliant 4-bar manipulator for control of coupler curve and energy harvesting.*

54. Rahul. Verma: *Studies on Directional Damping of Laminated Composite Plates using Laser Doppler Vibrometer.*

[2008]

- 55. J. Durgam: *Application of 3D Laser Doppler Vibrometer for Vibration Analysis and Damage Detection in Composite Plate.*
- 56. Nurul Huda Shaik: *Control of Instabilities in Pipes Conveying Pulsating Fluid using Shape Memory Alloy Based Actuation.*
- 57. M. Duttatredu: *Kineto-elastodynamic Analysis of Flexible Manipulator and Vibration Suppression using Ionic Polymer Metal Composite.*
- 58. Rajesh. Kudikala: *Multi-objective Optimization of Actuator Placement for Static Shape Control of Plates using Genetic Algorithm.*
- 59. N. S. R. Prasad: *Shape Memory Alloy based Actuation of Composite Beams and Shape Control of Parabolic Space Antenna.*

[2007]

- 60. Prasad Misri Kotkar: *Modeling and Development of Shape Memory alloy Based Actuator with an application to Parabolic Space Antenna.*
- 61. Seshu K Mahankali: *Optimal Distribution of Piezoelectric Actuators for Static Shape Control - Multi-objective Approach.*
- 62. Gaddam Raju: *Dynamic Analysis of Damaged Plate Structure and Experimental Validation using PVDF based Sensory Network.*
- 63. Pankaj Agarwal: *Design of a Robotic Gripper for Safe Handling of Nuclear Fuel Pellets Using PVDF Slip Sensors.*
- 64. Gaurav Bansal: *Development of an Autonomous Inspection System Based on PVDF based Cantilever Sensory Probe for Closed Conduits and Barrels.*
- 65. Vishal Kausal: *Design of a Compliant four Bar Pick and Place Mechanism Using SMP Rocker.*
- 66. M. Srinivasulu: *Comparison of Single Objective and Multi-Objective Based Form and Force Closure Grasp of 2D Prismatic Objects.*

[2006]

- 67. 64. Manoj Katore: *Development of PVDF and Terfenol-D based Shear Force Sensors for Robotic Fingers.*

68. Badrinath Mekap: *Active Shape Control of Parabolic Antenna Reflector using SMA based binary segmented actuation.*

69. Nitin K Galpat: *Nonlinear System identification using neural networks.*

70. S K Nijamuddin: *Analysis of electromechanical deformations.*

[2005]

71. Abhijit Banerjee: *Measurement of Aerodynamic Forces and Flow Visualization Study of Butterfly sized elliptic wing flapping models.*

[2004]

72. Vikram S Choudhuri: *Finite Element Analysis of Particulate Composite with PVDF Sensor.*

73. Arvind K Jaiswal: *Development of Smart High Precision Finite Element for Vibration Control and Health Monitoring of Composite Laminates.*

74. Srikant Shekhar Padhee: *Modelling, Simulation and Analysis of Single Link Flexible Manipulator.*

[2003]

75. Suman Basu: *Analysis of Flow Structure & Heat Transfer in Tube Banks and a tube in Rotating Configuration.*

76. Pavan Pachuri: *Finite Element Modelling of Electromechanical System using ATILA.*

77. Manish Sinha: *Vibration Generation and Shape Control of Composite Structure using SMA wire.*

[2002]

78. Ankur Gupta: *Modelling, Simulation and Damping of Flexible Manipulators.*

[2001]

79. Tarun Kumar: *Studies on the effectiveness of Magnetostrictive Sensors for Sensing Delamination in Composites.*

80. Lalit Sharma: *Elastic behaviour of 3D Model Cellular Solids.*

MS Thesis [4]

[2023]

1. Harsh Mirani: *Energy harvesting in topologically protected edge states using hourglass lattice based mechanical metamaterials*

[2018]

2. Saurabh Zajam: *Structural Health Monitoring of Gas Transportation Pipeline using Guided waves, Wavelet analysis and Machine Learning techniques*

3. Suraj Shinde: *Studies on the Dynamic Response of a Flexible Rotating Touch-Probe in a Confined Pipe System*

[2017]

4. Jatin Gupta: *Dynamic Modeling and Optimal Control of a Simple Lower Limb Exoskeleton System*

M Des Thesis [28]

[2017]

1. Vamshi Beeravelly, *To Design and Develop an Innovative Remotely Operable Mixing System for Medical Applications*

[2016]

2. Rohit K Singh, *Design and Development of an Energy Harvesting System from Vortex Induced Vibration*

3. Pankaj Rathoure, *Design and Development of Pipe Health Monitoring System*

[2015]

4. Asif Mohammad, *A Novel Multifunctional and Deployable Mobile Solar Energy Harvesting Bicycle Basket*

5. Chandan K Behera, *Automatic Sleep Arousal Detection and Analysis of Therapeutic techniques for Sleep Disorders*

[2014]

6. Basava K Mukkundi, *Design of an Interactive Walking Stick for Elderly People*

7. Rajesh Ranjan, *Design and Development of Networked Health Monitoring and Drug Control System*

[2013]

8.Priyanka Bharti, *Quality education over quantitative education at primary level in India.*

9.Jivtesh Singh Aulakh, *Engineering Design of Aluminium Composite Material with Rice Husk.*

10.Anshuman Karmakar, *Design of an Egocentric Display for Low Cost Collision Alerting Systems for Sport Aviation.*

[2012]

11.Reshma Maurya, *Design of a muscle power based energy harvesting device.*

12.Aravind Sanmuga Sundaram Muthuswamy, *Autonomous Play-Robot to Facilitate Learning in Children.*

[2011]

13.Sandipan Das, *Urban Mobility Solution.*

14.Rohit Raghuvanshi, *Development of an India-Centered Inspiration Process for Automobiles.*

15.Prithu Paul, *Studies in Asynchronous Web-Based Learning.*

[2010]

16.Atul R Sultane, *Design and development of a new energy harvesting device for mobile phones.*

17.Umang Shah Arvindkumar, *Concurrent Engineering and Industrial Design for the development of an Edutainment Product.*

18.Vimal Kumar, *Smart Drug Infusion: A New Product design.*

[2009]

19.M Arun, *Aesthetic explorations of advanced automobile design and balanced interior design of an intermediate public transport.*

20.Sneha Singh, *Discourse on Holistic Strategic Packaging Design.*

[2008]

- 21.V S Haveesh, *A new design solution for reducing scratches in small Indian cars.*
[2007]
- 22.Dharmendra K Gadaria, *Design of a Sitting Module for R129.*
[2006]
- 23.Rajendra Patsute, *Information Visualization and Design for Ancient Nalanda University.*
- 24.Abhishek Upadhyay, *Virtual reconstruction of Architecture of Nalanda University based on Information Visualization.*
25. Mayank Tiwari, *Web based interaction Design Modal to help reading disabled children in India.*
[2005]
- 26.Manish K Nema, *Intelligent Product Design Using SMA based technology.*
[2004]
- 27.Adesh K Singh, *User Interface Design for Touch-screen Based Navigation System.*
- 28.Vijay K Jaiswal, *Design of a Kiosk Enclosure for an Interactive Navigation System.*
-

PhD Supervision

PhD Thesis [17]:

Shree Ram Pandey, *Adaptive Shape Change using Shape Memory Alloy for Thermal Management* [2025]

Vivek Gupta, *Studies on novel hourglass lattice metastructures and its multifunctional applications as mechanical metamaterials* [2024]

Amanpreet Singh, *Modulation of Elastic Properties of Active Latticed Structures with Applications in Energy Harvesting Systems* [2023]

Aravind S S Muthusamy, *Understanding play-experience in children during play with interactive toys* [2022]

Ankur Dwivedi, *Dynamics of piezo-embedded mechanical metamaterials* [2022]

Jitendra Bhaskar, *Dynamic behavior of Shape Memory Alloy Embedded Composite Structure* [2021]

Rupal Srivastava, *Thermoelastic and Vibration Response Studies of Shape Memory Alloy Embedded Bimorph Composites* [2021]

Arun Kumar Sharma, *Material Characterization and Dynamic Response Studies on Inflated Torus System* [2020]

Manish Pande, *Optimising the dynamic response of a car-body in a freight vehicle fitted with three-piece bogies* [2019]

Kanishka Biswas, *Innovative Design of Air Sampler based on Critical Case Study on "OFF-LINE" PM Air Sampling* [2019]

Sahil Kalra, *Active Control of Electromagnetic Radiation Pattern from Reconfigurable Parabolic Antenna actuated by using Shape Memory Alloy based Smart Actuators* [2018]

Mohan K Misra, *Modelling and Adaptive Control of Layer Hardening of Steel Beams subjected to Electromagnetic Induction* [2016]

Ashesh Saha, *Analysis and control of friction-induced vibrations by time-delayed position feedback* [2013]

Anand Kumar, *Structural Health Monitoring of Composites using Smart Sensing and Actuation* [2010].

Atanu Banerjee, *Forward and inverse analyses of SMA actuated compliant links and mechanisms* [2009].

Ravindra K Patel, *Numerical Study of the Damping Behaviour of Polymer Matrix Composites* [2008].

Dibakar Bandopadhyay, *Active Vibration Control of Flexible Manipulator Using Terfenol-D and IPMC as Smart Actuator and an Application of IPMC in a Partially Compliant 4-bar* [2007].

5. Knowledge Dissemination

Book

Pipe Inspection Robots for Structural Health and Condition Monitoring, Harutoshi Ogai and Bishakh Bhattacharya, Springer, 2018

Book-chapters published:

Smart Material Based Micro-sensors and Actuators for Micromachining, Introduction to Micromachining , Narosa, 2010, 17.1-20.

Practical Applications in Constrained Evolutionary Multi-objective Optimizations, Springer, 2016, pp. 159-179.

Advances in Structural Engineering, Volume Three, 2016, pp.2621-2647.

NPTEL/MOOC Courses:**Video courses**

Principles of Vibration Control (<http://nptel.ac.in/courses/112104211/>)

Nature and Property of Materials (<http://nptel.ac.in/courses/112104203/>)

Foundations of Cognitive Robotics

(https://onlinecourses.nptel.ac.in/noc20_me92/preview)

Smart materials and Intelligent System Design

(https://onlinecourses.nptel.ac.in/noc19_me68/preview)

Web courses

- Materials Selection and Design (<http://nptel.ac.in/courses/112104122/>)
- Modelling and control of Dynamic Electro-Mechanical System
(<http://nptel.ac.in/courses/112104158/>)
- Principles of Vibration Control (<http://nptel.ac.in/courses/112104040/>)
- Smart Material, Adaptive Structures and Intelligent Mechanical Systems
(<http://nptel.ac.in/courses/112104173/>)
- Structural Health Monitoring of Composites (<http://nptel.ac.in/courses/112104160/>)

GIAN Courses

- Structural Health Monitoring using Pipe Crawler Robot with Prof. Harutoshi Ogai, IPS Waseda University, Japan (2017)
 - Bio-inspired Robotics with Prof. Hiroaki Wagatsuma, Kyushu Institute of Technology, Japan (2017)
-

6. Publications

International Journals & Proceedings [123]

1. AK Gautam, CC Yin and B Bhattacharya (2025). Defect Orientation Evaluation in Structural Plates Using Reflective Correlation Indexing, **IEEE Open Journal of Ultrasonics, Ferroelectrics, and Frequency Control**.
2. Ankur Dwivedi, R K Munian, Bishakh Bhattacharya and Sondipon Adhikari (2024). Bandgap formation mechanism in tacticity inspired elastic mechanical metastructures. **Scientific Reports**, 14 (1), 24611.
3. Ambuj Kumar Gautam, Ching-Chung Yin, Bishakh Bhattacharya (2024). Enhancing Shear Horizontal Wave Generation with a Multilayer Coil Electromagnetic Acoustic Transducer. **IEEE Transactions on Instrumentation and Measurement**.
4. RP Patil, N Kumar, A Kaur, RK Munian, Bishakh Bhattacharya, S Ganesh (2024). Retinal vascular pathology in a mouse model of Lafora progressive myoclonus epilepsy. **Neuroscience Research** 204, 58-63.
5. Ambuj Kumar Gautam, Ching-Chung Yin, Bishakh Bhattacharya (2024). Frequency-division multiplexing of chevron EMAT for orthogonal polarized SH waves. **IEEE Sensors**.
6. Rituparna Datta, A. Suneesh Jacob and Bishakh Bhattacharya (2024). Push or pull: grasping performance analysis between a pulling gripper inspired by Tetraonchus monenteron parasite versus an actively pushing gripper developed through many-objective design optimization. **International Journal of Intelligent Robotics and Applications**.
7. Ambuj Kumar Gautam, Ching-Chung Yin, Bishakh Bhattacharya (2023). A new chevron electromagnetic acoustic transducer design for generating shear horizontal guided wave. **Ultrasonics**
8. Ashish Shukla, Bishakh Bhattacharya (2023). Design and Development of Aquatic Autonomous Observatory Using QFD Methodology. **Design in the Era of Industry 4.0**, Volume 2.
9. Mirani H., Gupta V., Adhikari S. and Bhattacharya B., (2023). Tailoring of interface modes in topologically protected edge states with hourglass lattice metamaterials, **Journal of Sound and Vibration**, 562.
10. Gupta V., Singh A. and Bhattacharya B., (2023). Wave propagation study in metamaterial sandwich structure with periodically inserted hourglass resonators, **Active and Passive Smart Structures and Integrated Systems XVII**, 12483.
11. Singh A., Gupta V. and Bhattacharya B., (2023). Dispersion characteristics of a ZPR hourglass lattice structure, **Active and Passive Smart Structures and Integrated Systems XVII**, 12483.
12. Sinha Y., Chaurasiya K. L., Patel Y. A. K., Gupta T. and Bhattacharya B., (2023). Design and development of novel rotary actuation system based on shape memory alloy

springs driven mechanism arranged in bipennate muscle architecture, **Active and Passive Smart Structures and Integrated Systems XVII**, 12483.

13. Gautam A. K., Wu W. C., Yin C. C and Bhattacharya B., (2023). Investigation of mode conversion of SH waves at the welded tabular ends of a fuel storage tank, **Health Monitoring of Structural and Biological Systems XVII**, 12488.
14. Chaurasiya K. L., Pawar V. and Bhattacharya B., (2023). An innovative method and apparatus for speed control of pipe health monitoring robot during gas pipeline inspection, **Health Monitoring of Structural and Biological Systems XVII**, 12488.
15. Das R., Baishya N. J. and Bhattacharya B., (2023). A review on tele-manipulators for remote diagnostic procedures and surgery, **CSI Transactions on ICT**, 11, 31-37.
16. Singh A., Mukhopadhyay T., Adhikari S. and Bhattacharya B., (2022). Extreme on-demand contactless modulation of elastic properties in magnetostrictive lattices, **Smart Materials and Structures**, 31.
17. Sheikh T., Sampath S. and Bhattacharya B., (2022). Bimorph sensor based in-line inspection method for corrosion defect detection in natural gas pipelines, **Sensors and Actuators A: Physical**, 347.
18. Shaik N. H., Sharma A. K. and Bhattacharya B., (2022). Effect of Shape Memory Alloy Actuation on Parametric Instability in Pipes Conveying Pulsating Fluid, **Journal of Vibration Engineering & Technologies**.
19. Bhattacharjee A., Dachkinov P., Bhattacharya B. and Wagatsuma H., (2022), Determining the elastic properties of flexible 3d printed beams with variable infill densities and patterns, **International Journal of Engineering Advanced Research**, 4, 12-24.
20. Dachkinov P., Bhattacharjee A. and Bhattacharya B. and Wagatsuma H., (2022). A Multi-Material Joint System as a Three-Dimensional Spring-Damper Compliant Mechanism Toward Functional Versatility, **Journal of Advances in Artificial Life Robotics**, 3, 66-72.
21. Patel A., Yadav A., Law M., Bhattacharya B. and Wahi P., (2022). Damped Chatter Resistant Boring Bar Integrated with an Absorber Working in Conjunction with an Eddy Current Damper, **Journal of Vibration Engineering & Technologies**.
22. Gupta, V., Munian, R. K. and Bhattacharya, B. (2022). Dispersion analysis of the hourglass-shaped periodic shell lattice structure. **International Journal of Solids and Structures**, 254–255.
23. Chaurasiya, K. L., Harsha, A. S., Sinha, Y. and Bhattacharya, B. (2022). Design and development of non-magnetic hierarchical actuator powered by shape memory alloy based bipennate muscle. **Scientific Reports**, 10758.
24. Kuponu, S., Kadiramanathan, V., Bhattacharya, B. and Pope S. A. (2022). A material system with integrated fault diagnosis and feedback controlled self-healing, **International Journal of Adaptive Control and Signal Processing**, 36(1).
25. Singh A., Bhattacharya B., Banerjee A., (2022), Vibration attenuation in graded meta-sandwich beam, **Active and Passive Smart Structures and Integrated Systems XVI**, 12043.
26. Singh A., Mukhopadhyay T., Adhikari S., Bhattacharya B., (2022), Voltage modulation of elastic properties of asymmetric hybrid lattice structure, **Active and Passive Smart Structures and Integrated Systems XVI**, 12043.

27. Gupta V., Munian R. K., Bhattacharya B., (2022), Dispersion analysis of periodic hourglass-shaped metamaterials for wave propagation, **Active and Passive Smart Structures and Integrated Systems XVI**, 12043.
28. Gourav K., Singh A., Bhattacharya B., (2022), A study on bandgap attenuation in metamaterials by varying the shape of cross-section, **Active and Passive Smart Structures and Integrated Systems XVI**, 12043.
29. Mirani H., Gupta V., Adhikari S., Bhattacharya B., (2022), Interface modes in topologically protected edge states using hourglass based metastructures, **Active and Passive Smart Structures and Integrated Systems XVI**, 12043.
30. Gupta, V., Adhikari, S. and Bhattacharya, B. (2022) Energy absorption of hourglass shaped lattice metastructures" has been accepted for publication in Experimental Mechanics, **Experimental Mechanics**, 62, pp. 943-952.
31. Srivastava, R. and Bhattacharya, B. (2022). De-coupling the Eigenmodes of SMA-reinforced Bimorph Composites using Multi-objective Optimization. **Journal of Vibration Engineering & Technologies**.
32. Dwivedi, A., Banerjee, A., Adhikari, S. and Bhattacharya, B. (2022) Bandgap merging with double-negative metabeam, **Mechanics Research Communications**, 122.
33. Sharma, A. K. and Bhattacharya, B. (2022) Engineering design of sustainable aluminium composite material with rice husk core, **International Journal of Sustainable Engineering**, 14.
34. Singh, A., Mukhopadhyay, T., Adhikari, S. and Bhattacharya, B. (2021). Active multi-physical modulation of Poisson's ratios in composite piezoelectric lattices: On-demand sign reversal, **Composite Structures**, 280.
35. Baishya, N. J., Bhattacharya, B., Ogai, H. and Tatsumi, K. (2021). Design of an Anti-Slip Mechanism for Wheels of Step Climbing Robots, **Actuators**, 10.
36. Baishya, N. J., Bhattacharya, B., Ogai, H. and Tatsumi, K. (2021). Analysis and Design of a Minimalist Step Climbing Robot, **Applied Sciences**, 11.
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45. Ahmed F., Bhattacharya B. and Deb K., (2012), Constructive Solid Geometry based Topology Optimization using Evolutionary Algorithm, **Proceedings of Seventh International Conference on Bio-Inspired Computing: Theories and Applications**, 201.
46. Agarwal V., Daftry S., and Bhattacharya B., (2011), An Innovative Approach to Pipeline Health Monitoring using Crawler Robot with PVDF based Probe, **International Conference on Robotics**.
47. Oyabu R., Nishijima K., Wang Z., Ogai H., Bhattacharya B., (2011), Advanced Pipe Inspection Robot using rotating probe and Image processing. **International Symposium on Artificial Life and Robotics, AROB'**
48. Arun M. and Bhattacharya B., (2011), Cultural Influence in Aesthetic Design: A Case Study based on Intermediate Public Transport Vehicle, **International Conference on Research in Design**.
49. Kumar A. And Bhattacharya B., (2011), Experimental Modal Analysis for Damage Detection in Composite Plates using Laser Doppler Vibrometer, **International Conference on Research in Structural Health Monitoring**.
50. Nishijima K., Sun Y., Srivastava R. K., Ogai H. and Bhattacharya B., (2010), Advanced Pipe Inspection Robot using Rotating Probe, **International Conference on Smart Materials Structures and Systems**.
51. Sultane A. and Bhattacharya B., (2010), Energy Harvesting from a combination of solar, wind and vibrational energy, **International Conference on Research in Structural Health Monitoring**.
52. Bansal G. and Bhattacharya B., (2010), Pipe health Monitoring using PVDF Sensor, **International Conference on Research in Structural Health Monitoring**.

53. Prasad N., Lad R., Munjal B.S., Mathur A.C. and Bhattacharya B., (2010), Shape Memory Alloy Wire Based Actuation of Beam Stiffener and Optimal Shape Control of Parabolic Space Antenna, **International Conference on Smart Materials and MEMS**.
 54. Arun M., Vimal K. and Bhattacharya B., (2009), User study and design modifications of a CNG based intermediate public transport vehicle, **Indo-Us Workshop on Designing sustainable Products, Services and Manufacturing Systems**.
 55. Aggarwal P., Dutta A. and Bhattacharya B., (2007), Cooperation between a 4 DOF robotic hand and a human for carrying an object together, **SICE Annual Conference**.
 56. Bandopadhyaya D. and Bhattacharya B., (2008), Design and Development of a Partially Compliant 4-bar using IPMC for Work Volume Generation, **Proceedings of AIP**, 1029.
 57. Shaik N. H., Bhattacharya B., (2008), Control of instabilities of pipes conveying pulsating fluid using Shape Memory Alloy based actuation, **International Conference on Smart Materials Structures and Systems**.
 58. Banerjee A., Bhattacharya B. and Mallik A. K., (2008), Optimum offset of SMA wires for discrete actuation of cantilever beams, **ASME International Conference**.
 59. Banerjee A., Badothiya J., Bhattacharya B., Mallik A. K., (2008), Optimum Discrete Location of Shape Memory Alloy Wire for Enhanced Actuation of Slender Fixed-Free Beam, **Smart Materials, Adaptive Structures and Intelligent Systems**.
 60. N.S.R Prasad Ndevara, Mishrikotkar P. K. and Bhattacharya B., (2007), Modeling and Development of SMA wire based actuators with an application to Parabolic Space Antenna, **International Conference on Smart Materials and MEMS**.
 61. Bandopadhyaya D. and Bhattacharya B., (2006), A Dynamic Performance Evaluation of Flexible Manipulator with Active Proportional Damping and Estimation Algorithm, **IEEE International Conference on Robotics, Automation and Mechatronics**.
 62. Bandopadhyaya D., Bhogadi D. B., Bhattacharya B. and Dutta A., (2006), Active Vibration Suppression of a Flexible Link using Ionic Polymer Metal Composite, **IEEE International Conference on Robotics, Automation and Mechatronics**.
 63. Bhattacharya B. and Barlingay R., (2005), Integrated Damage and Damping Monitoring of Flexible Composite Manipulators using TEDS based Smart Sensors, **4th Asian Conference on Industrial Automation and Robotics**.
 64. Bhattacharya B. and Jaiswal A., (2004), Damage Detection in Ribbon Reinforced Composite Laminate using Piezoelectric Sensory Layer, **International Conference on Advances on Structural Integrity**.
 65. Asthana C. B., Bhattacharya B., Bhat M. S. and Krishnamurthy A. V., (1999), Static Output Feedback Design to Control a Smart Cantilever Beam, **ISSS-SPIE'99**.
 66. Bhattacharya B., Murty K. A. V. and Bhat M.S., (1994), Free Vibration Study of Laminated Composite Plates Using High Precision Triangular Elements, **National Seminar on Aero Structures**.
 67. Bhattacharya B., Bhat M.S., and Murty K. A. V., (1994), Dynamics and Control of Laminated Composite Structures with Surface Bonded/Embedded Sensors and Actuators, **Discussion Meetings on Aerodynamic Testing and Structural Dynamics**.
 68. Bhattacharya B., Murty K. A. V., Anjanappa M. and Bhat M. S., (1994), Dynamic Modelling of Smart Composite Beams, **National Symposium on Developments in Advanced Composites and Structures**.
-

7. Technology Development & Patents

List of Technology Development:

- Energy Absorbing Composite Joint Technology for Vibration Damping, TU Sheffield
- Non-contact Magnetostrictive Damper for Rolls Royce UTC, TU Sheffield
- Hybrid Damping for Flexible Rotor, IIT Kanpur
- Dynamic Response based Structural Health Monitoring System in Laser Doppler Vibrometer, IIT Kanpur
- Laser Doppler Vibrometer based Hardness Estimation System, IIT Kanpur
- Portable Induction Hardening System, IIT Kanpur
- Smart Flexible and Mechanically Reconfigurable Antenna System, IIT Kanpur
- Energy Harvesting System from Vortex Induced vibration, IIT Kanpur
- Pipe Health Monitoring System based on Smart Sensors, IIT Kanpur
- Shape Memory Alloy based Auto-turn Indicator Mechanism, IIT Kanpur
- A Smart Cabin Pressure Control System Simulator, IIT Kanpur
- A Generic Scanning and Fault Detection System for Axisymmetric Metallic Structure, IIT Kanpur
- Eddy Current Damper for Vibration Control, IIT Kanpur
- A Carbon-di-oxide sensing system for Bronchoscope, SGPGI, Lucknow

List of Patents:

US/Intl. Patents:

1. A Novel Non-contact damping technique using magnetostrictive particulate Coatings, GB2365376, Bishakh Bhattacharya, Geof Tomlinson and Jem Rongong, The Patent and Design Journal No 5986.
2. Vibration damping system and a method of damping vibrations, United States Patent 6688439, Bishakh Bhattacharya, Geof Tomlinson and Jem Rongong

Indian Patents:

1. Bhattacharya B., Chaurasiya K. L., Sinha Y., An Automated Pipe Following Modular Bulk Carrier for Continuous Material Transportation, 202211077045, 30.12.2022.
2. Bhattacharya B., Pandey S. R., A Shape Memory Alloy-based Adaptive Thermal Fin for Thermal Management, 202211055252, 27.09.2022.
3. Gohil M. K., Bhattacharjee A., Bhattacharya B., Biswas S. K., A Robot System for Automatically Managing Agricultural Activities, 416719, 04.01.2023.
4. Gohil M. K., Bhattacharjee A., Pandey D. J., Vashishtha C., Bhattacharya B., A System for Facilitating Two-dimensional Fluid Movement of an Object Over An Area, 401748, 21.07.2022.

5. Chaurasiya K. L., Bhattacharya B., Harsha A. S., Bipennate Muscle Architecture-based Shape Memory Alloy Embedded Hierarchical Actuator, 414106, 09.12.2022.
6. Sharma S., Singh V. R., Garg V., Pandey D. J., Kalra S., Bhattacharya B., Hartl D. J., A System for Origami Based Re-configurable Antenna with Steering Mechanism, 202011031690, 24.07.2020.
7. Chaurasiya K. L., Bhattacharya B., Barathy S., Kumar S., Speed Control System for Pipe Health Monitoring Robot, 202011016379, 15.04.2020.
8. Matharu P. S., Bhattacharya B., Apparatus and Method for Real-time, in Situ Monitoring of Water Quality, 372496, 22.07.2021.
9. Khara S., Zambre J., Sangal S., Mondal K., Bhattacharya B., Bose A., Art of Making Earthenware with Variable Porosity and High Damping Capacity, 201911038028, 20.09.2019.
10. Garg A., Bhattacharya B., Agarwal A., Gautam S., A Sensing-Based Guidance Device for Endotracheal Intubation and a Method for Operating the Same, 201811046913, 12.12.2018.
11. Garg A., Chinthulal V. S., Bhattacharya B., Gupta D., A Wireless Pressure Sensor Node for an Inflatable Structure, 201811042160, 08.11.2018.
12. Biswas K., Dey P., Ray E., Bhattacharya B., Gupta T., Ergonomic Retractable Novel Stair (Close View), 301961, 19.06.2020.
13. Biswas K., Dey P., Ray E., Bhattacharya B., Gupta T., Ergonomic Retractable Novel Stair (Open View), 301960, 02.02.2018.
14. Bhattacharya B., Kumar S., Shah D. R., Sankhla H. K., Smart Stick, 201711043515, 05.12.2017.
15. Bhattacharya B., Tiwari N., Ramkumar J., Mathur G., Tandon S., Lodhi C., A Packing Case for One or More Large-caliber Ammunition Shells, 201711043201, 01.12.2017.
16. Kalra S., Bhattacharya B., Munjal B. S., A Self Locking Actuation System, 402596, 29.07.2022.
17. Bhattacharya B., Tiwari N., Ramkumar J., Mathur G., Tandon S., Lodhi C., Packaging System for Large Caliber Ammunition Design, 280638, 03.12.2018.
18. Khandekar S. and Bhattacharya B., An Integrated Solar Energy Harvesting and Storage, 410145, 27.10.2022.
19. Khandekar S., Bhattacharya B. and Jain A. K., Shape Memory Alloy (SMA) Wire as Sensor for Taylor Bubble Flow Regime of Two-phase Flows, 412108, 22.11.2022.
20. Bhattacharya B., Tiwari N., Baishya N. J., Panday H., Verma V., Barathy S., Kashyap R. K., Chugh P., Yuvaraj T. P., A Novel Self Powered, Intelligent Pipe Health Monitoring Robot (PHMR) for Inspecting Gas Pipe Line, 403841, 18.08.2022.
21. Panday H., Bhope V. and Bhattacharya B., Home Automation System Utilizing Digital Waste, 212/DEL/2015, 23.01.2015.
22. Bhattacharya B. and Aulakh J. S., Composite Panels with Rice Husk Core, 375017, 23.08.2021.
23. Basav K. M. and Bhattacharya B., Multifunctional Interactive Walking Stick, 415546, 27.12.2022.
24. Singh R. K. and Bhattacharya B., Vibration Energy Harvesting Device, 422527, 21.02.2023.
25. Ranjan R., Basava K. M., Bhattacharya B., Methods and Systems for Health Monitoring, 5/DEL/2014, 01.01.2014.

26. Ranjan R., Basava K. M., Bhattacharya B., Flow Control Device, 405656, 02.09.2022.
27. Ranjan R., Basava K. M., Bhattacharya B., Drug Flow Control Device, 3847/DEL/2013, 31.12.2013.
28. Sharma S., Bhattacharya B., Arvind S. S. M., Ramkumar J., Hand Pump (Design), 249921, 19.06.2018.
29. Sharma S., Bhattacharya B., Arvind S. S. M., Ramkumar J., A Novel Tube-well Hand Pump, 384474, 16.12.2021.
30. Bhattacharya B., Agarwal A., A Modular Robotic System, 336061, 27.04.2020.
31. Bhattacharya B., Sultane A. R., A Green Harvesting Device for Low Power Electronic Equipment (Design), 232707, 26.08.2011.

Brief List of Products

1. Design of a Kiosk Enclosure for an Interactive Navigation System
2. User Interface Design for Touch-screen Based Navigation System
3. Design of a Sitting Module for R129
4. Design and development of a new energy harvesting device for mobile phones.
5. Autonomous Play-Robot to Facilitate Learning in Children.
6. Design of a muscle power based energy harvesting device
7. Design of an Egocentric Display for Low Cost Collision Alerting Systems for Sport Aviation
8. Engineering Design of Aluminium Composite Material with Rice Husk.
9. Design and Development of Networked Health Monitoring and Drug Control System
10. Design of an Interactive Walking Stick for Elderly People
11. Automatic Sleep Arousal Detection and Analysis of Therapeutic techniques for Sleep Disorders
12. A Novel Multifunctional and Deployable Mobile Solar Energy Harvesting Bicycle Basket
13. Energy Harvesting System from Vortex Induced Vibration
14. Pipe Health Monitoring Robot
15. Smart Antenna System
16. SMA based Auto-locking System
17. SMA based Turn-Indicator System
18. Adjustable Surgical Support System
19. A smart 7 Link Gripper Mechanism
20. A Pond Cleaning Robot
21. Design and Development of a Pipe Scanning System for Fault Detection and Sensor Calibration
22. Design and Development of High Precision Agriculture Robot
23. Design and Development of Autonomous River Health Monitoring Robot
24. Design and Development of Artificial Bipennate Muscle Actuator based on SMA
25. Device for Determining Plant Health and Pesticide application

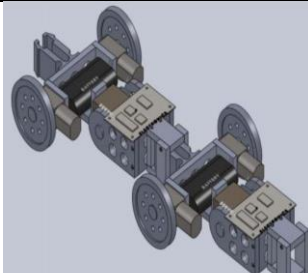
Images of a few Selected Products

Energy Harvesting
Pipe Health
Monitoring Robot
for Natural Gas
Pipe-lines (GAIL)



Smart Antenna
System for ISRO

Morphable Stick for
the Elderly



Self-reconfigurable
Modular Robot

Automated River Health
Monitoring Platform



Portable Energy
Harvesting System



Agricultural Robot



Automatic Flow
Control Device



Artificial Muscle based
Linear Actuator
(Johnson Controls)

8. Research Funding (Sponsored and Consultancy)

Sponsored Projects (PI)					
Sr. No.	Project Name	Project Title	Duration	Funding	Status
1	MHRD /ME /20020027	Development of Smart Composite Prosthetic Limbs	2 Years	10,00,000	Completed
2	ARDB /ME /20030189	Smart Hybrid Damping Of Vibration On Rotating Flexible Links	2 Years	7,73,000	Completed
3	ISRO /ME /20060030	Control of Flexible And Reconfigurable Parabolic Antenna Using SMA Based Smart Actuators	2 Years	14,50,000	Completed
4	DST /ME /20060263	Design of A Smart Fully Compliant Mechanism Of Trajectory Tracking	3 Years	21,93,000	Completed
5	ARDB /ME /20070188	Modelling And Development Of Multiphase Micro-Structured Damping Layer For Broadband Vibration Damping In Flexible Links	2 Years	8,80,000	Completed
6	DST /ME /20090154	Optimal Vibration Control of Composite Structure	3 Years	12,11,175	Completed
8	UKIERI/MDES/20120045	Integrated Sensing, Monitoring and Healing For Complex Autonomous Systems	3 Years	11,43,100	Completed
9	STC /ME /20120326	Phase-Ii Expanded Proposal on Design of Active Flexible And Re-Configurable Parabolic Antenna Using Sma Based Smart Actuators	2.5 Years	21,91,200	Completed
10	GAIL /ME /2015079	Development Of Compressed Air Based Test Bed For Pipe-Line Health	2.5 Years	71,06,000	Completed

		Monitoring Robot			
11	MHRD /DOFA/2015298D	Pipe Inspection Robots For Structural Health Monitoring (GIAN)	3 Months	8,16,000	Completed
12	MHRD /SIIC/2015371	Make In India Event (Mumbai)	1 Year	10,00,000	Completed
14	MSDE /ME /2017174	National Entrepreneurship Awards Scheme 2017	1 Year	20,00,000	Completed
15	MHRD /ME /2017245	Fundamentals Of Bio-Inspired Robotics	3 Months	6,19,400	Completed
16	STC /ME /2018044	Shape Memory Alloys Actuated Mechanically Active Reconfigurable Lightweight PEEK material Based Parabolic Reflector For Active Control On RF Patterns for high Frequency Micro/Nano Spacecraft Application	2 Years	36,78,400	Completed
17	IUSSTF/ME /2017400	Design & Development of Aquatic Autonomous Observatory (Niracara Svayamsasita Vedhshala-Nsvs) For In Situ Monitoring, Real Time Data Transmission & Web Based Visualization	5 Years	9,00,00,000	Ongoing
18	STC /ME /2017183	Design Validation Of Active Flexible And Reconfigurable Parabolic Antenna Using SMA Based Smart Actuator	1 Year	8,40,000	Completed
19	GAIL /ME /2017069	Design and Development of Adoptive Intelligent PHMR For Fuel	2 .5Years	2,01,48,000	Completed

		Transportation Systems			
20	MHRD /ME /2016142L	Design and Construction of Computer Controlled Automated Radio-Chemistry Synthesizer	2 Years	5,12,539	Completed
21	MHRD /ME /2016142M	Designing and Manufacturing of Prototype of Dynamic Endotracheal Tube Holder	2 Years	6,87,758	Ongoing
22	MHRD /ME /2016142N	Development of A Fiber Optic Intubation Device With A Co-Sensor At Its Tip For Facilitation Of Endotracheal Intubation	2 Years	4,68,500	Ongoing
23	MHRD /ME /2016474	Design and Development of Adaptive Intelligent PHMR For Fuel Transportation Systems MHRD(DST) UAY	3 Years	1,89,80,000	Ongoing
24	DBT/ME/2014172	Seamless Affordable Assistive Technology for Health (SAATH)	3 Years	32,00,000	Completed
25	STC/ME/2014086	Design of A Smart Inflated Torus and Antenna Membrane	4 Years	46,18,800	Ongoing
26	MHRD /ME /2018544	Sparc: Vibration Absorption Using Metamaterial Based Composites	2 Years	97,23,515	Ongoing
27	DST /ME /2018247	Neuro-Cognitive Instrumentation of Validated Human-Robot Interactions to Enhance Learning and Developmental Processes in Children	2 Years	6,28,000	Ongoing
28	PORTESCAP INDIA Private Ltd	Development of an Intelligent Sit-O-		9,50,000	Ongoing

		Stand (STS) and Mobility Support System for the Elderly			
29	PORTESCAP INDIA Private Ltd	Design and Development of a Miniature Rotary Actuator Based On Flexinol SMA		19,00,000	Ongoing
30	Johnson Control India Ltd	SMA based bipennate Actuator Development		57,96,000	Ongoing
		Total		184,514,387	(INR)
Consultancy Projects (PI)					
1	HAL /ME /20030013	Calibration of Portable Hardness Tested And Micro Hardness Testing of Steel Samples	1 Month	10,000	Completed
2	HAL /ME /20030304	Design and Establishing Parameters For Mechanical Test Samples	2 Weeks	7,500	Completed
3	GM /MDES/20040312	Development of a Novel Turning Indicator Mechanism Using Shape Memory Alloy Based System	9 Months	4,92,600	Completed
4	NAIK(N/ME /20070241	Feasibility Study Report For Development Of Digital Bore Measuring Instrument	9 Months	1,54,275	Completed
7	GAIL /ME /20080163	Deflection & Vibration Compensation of Gas-pipe Line At Ramganga	1 Week	14,045	Completed
8	HAL /ME /20090015	Matlab Based Modeling, Simulation and Validation of LCH Main and Tail Rotor Actuators	1 Year	2,13,700	Completed
9	GHANAR/MDES/20110256	Design Consultancy of Steel Gates of Ramganga Barrage	1 Year	2,89,538	Completed

10	GAIL /ME /20130112	Design and Development of a Pipeline Health Monitoring Robot Based On Smart Sensor Embedded Rotating Probes And An Efficient Data Communication	2 Years	42,82,534	Completed
11	OFKNP /ME /2014056	Modelling and Estimation of Structure Capacity of EOT Crane	1 Year	5,61,800	Completed
12	TECHNO/ME /2014362	Vetting of Design And Drawings Of Vertical Lift Gates Of Pahari Dam In Dist Jhansi of Uttar Pradesh	1 Year	4,80,760	Completed
13	HAL /ME /2015072	Development of Cabin Pressure Control System For LCA	1 Year	14,26,000	Completed
14	MISC /ME /2019025	Miscellaneous Structural and Product Design	1 Year	2,21,250	
		Total		8,154,002	(INR)

9. Peer Recognition

- Professor-in-charge, Indian Institute of Skills, Kanpur
- HAL Chair Professor Award, (2021-2024), HAL Lucknow
- Mentor of the best B Tech Project, Dept. of Mechanical Eng, 2020
- Centre of Excellence Award, 2019, Johnson Controls, India
- GCRF Visiting Fellowship, 2019, Swansea University, UK
- DST-JSPS Fellowship, (2018-2019), Kyushu Institute of Technology, Japan
- Dr. and Mrs. Mehta Chair Professor, 2014-2017, IIT Kanpur
- Sakura Fellowship, JSPS, 2017 and 2018, Kyushu Institute of Technology, Japan
- Member of the Board of AR&DB Systems Panel [2018-cont.]
- Academic Representative, Mentor Council of DGET, Industrial Automation & Instrumentation [2014-]

- Empaneled Eminent Expert, National Manufacturing Competitiveness Program [2013-]
- UKIERI award by UK India Research Initiative Council [2012-2014]
- DST-UKIERI award by DST and UK India Research Initiative Council [2009-2011]
- Young Scientist's award for the year 2006 by the Systems Society of India
- Nominated as a special member in the Senate, IIT-Kanpur from 2003-2005
- Department of Science and Technology, India, Young Scientist Award, 2001
- Recipient of Best Thesis Award in the Department of Aerospace Engineering, 1998
- Senate Commendation for excellent teaching in the courses: *Principles of Vibration Control* and *Design Practice*
- Student Mentor in Design Program for the following National Awards
 - 2nd Runners up, Nokia Bhasha 2011 - Rahul, Madhavan, Meenakshi, Aravind, Nishant
 - 1st Prize|Design Challenge-08|Yahoo R&D, Bangalore for designing of a transportation system for the differently able people.
 - Display Selection in Auto Expo 2008
 - 1st Prize|Design Challenge-09|IISC, Bangalore for designing a sustainable mobile phone

Member of the Editorial Boards

International Journal of Low Frequency Noise, Vibration and Active Control

Associate Editor: ISSS Jl. of Micro and Smart Systems

Associate Editor: International Journal of Systems Science

Associate Editor: Journal of Vibration Engineering Technologies

Reason – a Technical Journal

10 Contributions to the Institute:

Administrative Experience

Coordinator, Space Technology Cell [2021- cont]

Coordinator, Telemedicine and Robotics [2021- cont]

Head, Cognitive Science [2017-2020]

Coordinator, Space Technology Cell [2014-2020]

Head, Central Workshop [2014-2017]

Head, Design Programme [2011-2013]

Coordinator, Dynamics & Vibration UG Lab, Department of Mechanical Engineering, IIT Kanpur [2010-Continuing]

Coordinator, Automation & Control UG Lab, Department of Mechanical Engineering, IIT Kanpur [2007-Continuing]

Coordinator, Smart Materials, Structures & Systems Research Lab, Department of Mechanical Engineering, IIT Kanpur [2000-Continuing]

Coordinator, Living System Inspired Design Research Lab, Design Programme, IIT Kanpur [2013-Continuing]

Coordinator, Post-Graduate Association of Mechanical Engineers [2001-2003]

Coordinator Master of Design Programme [2002-2004]

Convener, Departmental Post Graduate Committee, MDES [2002-2004]

Convener, Solid Mechanics and Design Stream, Department of Mechanical Engineering Representative [2007]

Senate Library Committee & Programme Advisory Committee (PAC) member of Design Programme [2002-2007]

Coordinator, Experimental Stress Analysis Lab, Department of Mechanical Engineering, IIT Kanpur [2004-2007]

Convener, Departmental Post Graduate Committee, ME [2004-2005]

Governing Body Member, Campus School [2013-2017]

11. Other Academic Activities

Keynote Address

Metamaterials and Metastructures: the futuristic panacea for Vibration and Shape Control, SXIP 2023, Yokohama National University, Japan [2023]

Energy harvesting by smart and metamaterials: feasibility and application potential, Innovation in Practice conference, University of Lublin, Poland [2023]

Invited Speaker

Electro-Mechanical Modelling of Axon Potential Propagation, Harvard Bionics Lab, Harvard University [2023]

Nuances of Designing Cognitive Robots through case studies at SMSS lab, IIT Kanpur, Indian Institute of Technology Delhi [2023]

Panelist: Energy Asset Integrity Management: Digitalisation, IISc Bangalore [2023]

From fiber to force: Next-gen artificial muscle actuator powered by shape memory alloy, Joint Symposium of IIT Kanpur and IIT Genoa, Italy [2022]

Smart Beam and High Precision Plate Elements for Aerospace Application, IIT Jammu [2021]

An Overview of Intelligent System Design using Smart Material based Sensors and Actuators: Current Experiences and Future Possibilities, Swansea University, UK [2019]

Design and Development of Adaptive Intelligent Pipe Health Monitoring Robots for Fuel Transportation Systems, Ritsumeikan University, Japan [2019]

Smart Materials for Micro machining, in the Short-Term School on "Micromanufacturing and Its Applications" April 05, IIT Kanpur [2014].

IITK-UKIERI Airbus seminar: 12th March, 2014, *Dynamic Response based Damage Detection and Adaptive Structural Control (Morphing)* [2014].

IPS 9th Symposium at Waseda University, Japan on *Adaptive Control of Parabolic Antenna System by SMA Actuators* [2013].

UKIERI Presentation at Sheffield University, UK on *Mechanical and Chemical Healing of Damaged Composites* [2013].

SAC, Ahmadabad (ISRO) on *Intelligent System Design* [2013].

IIT Patna on *Embodiment of Intelligence in Product Design: Inspirations from Nature* [2013].

Boeing India, Bangalore, *Smart Materials and Intelligent Systems Design at IIT Kanpur* [2013].

HBTI, Kanpur, *Future Directions in Material Selection for Advanced Design* [2013].

Seminar & Workshops

Chairman of the Organizing Committee of 7th ISSS National Conference on MEMS and Smart Materials, Structures and Systems, 2016

Convener of 1st National Workshop from Space Society of India on Inflated Space Structures, 2016

Convener of SAATH Workshop on Smart Stick and Exoleg System, 2015

Session-Chair: Dynamic System Modelling, Design and Optimization, ACODS-2014

UG Convener: IITK-INAE joint competition on *Innovation in Manufacturing Practice* [2014]

Coordinator: Design Clinic, December, 2012

Noise Vibration and Harshness 2012 – jointly with Dr. Nachiketa Tiwari and Prof. N. S. Vyas.

Continuing Education Workshops:

- (a) Material Selection for Engineering Design – 3 weeks short course offered on line.
- (b) Engineering Product Design jointly with IACT [2013 and 2012]

A Short Course in Noise and Vibration jointly with Dr. Nachiketa Tiwari and Prof. N. S. Vyas [2011].

Coordinator – National Workshop on Smart Materials for Design of Intelligent Systems and Industrial Application (SMDISA-2007)

Coordinator - National Workshop on Smart Materials and Structures (SMCS-2002)

Faculty Selection Committee Member

Mechanical Engineering Department, IIT Mandi [2021]

Cognitive Science Department, IIT Kanpur [2020-Cont..]

Mechanical Engineering Department, IIT Kanpur [2015-2017]

Mechanical Engineering Department, IIT Patna [2008]

Mechanical Engineering Department, HBTI, Kanpur [2007]

12. Reviewer of Technical Journals

Nature Scientific Report

Smart Materials & Structures

Journal of Vibration & Control

Journal of Vibration & Acoustics

Journal of Low Frequency Noise, Vibration and Active Control

Journal of the Institution of Engineers India: Series C

Scripta Physica

Transactions on Magnetics

IEEE Journal of Sensors

Journal of Intelligent Material Systems

IEEE Transactions on Vehicular Technology
