

Gaurav Sharma

Ph.D. (PMRF) Research Scholar, IIT Bombay, Mumbai, India-400076

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📄 Gaurav-Sharma-143

🎓 scholar.google.com/citations?user=s9qV8mAAAAAJ

🌐 LinkedIn Profile

Education

- Jan 2019 – Present 📄 **Ph.D., Fluid-Structure Interaction (FSI)**, Indian Institute of Technology Bombay, Mumbai-400076
Supervisor: Dr. Rajneesh Bhardwaj (Professor)
Funding: Prime Minister Research Fellowship (PMRF)
Thesis Title: Optimizing flow-induced vibration using shape and elastic coupling for vibration suppression and energy harvesting applications.
Key Subjects: Fluid-Structure Interaction, Fluid Mechanics, Mathematical Methods in Engineering, High Performance Scientific Computing
Final Grade: 9.45/10
- Aug 2016 – Nov 2018 📄 **M.S.(by Research), Acoustics and Vibrations**, Indian Institute of Technology Mandi, Mandi, H.P.-175005
Funding: Half-Time Research Assistantship (HTRA)
Supervisor: Dr. Arpan Gupta (Associate Professor)
Thesis Title: Analytical Solution and Experiments in Wave Propagation Problems.
Key Subjects: Vibrations, Acoustics, Advanced FEM
Final Grade: 9.6/10
- July 2011 – May 2015 📄 **B.Tech., Mechanical Engineering**, National Institute of Technology Hamirpur, Hamirpur, H.P.-177005
Major Project: Wear Analyzer, wear-calculating software for direct calculation of wear parameters using various wear models.
Key Subjects: Solid Mechanics, Fluid Mechanics, Neural Networks and Fuzzy Logic, Condition Monitoring
Final Grade: 8.08/10

Employment History

- July 2015 – July 2016 📄 **Graduate Engineer Trainee**, Hero MotoCorp Ltd., Neemrana, Alwar-301709.
Department: Machine Shop HMCL Neemrana Plant
Job Profile: Machining of Engine Components and Shift Management
Accomplishment: Implemented Poka-Yoke for avoiding accidents on Thread Rolling Machine

Teaching Experience

- 2021 – 2022 📄 **Co-Instructor**, Mechanical Engineering Department, VJTI Mumbai-400019.
Subject: Machine Dynamics and Vibration (M.Tech 1st year)
- 2022 📄 **External Teaching Assistant**, National Programme on Technology Enhanced Learning (NPTEL)
Subject: Principles of Vibration Control (Prof. Bishakh Bhattacharya, IIT Kanpur)
- 2016 – 2018 📄 **Institute Teaching Assistant**, IIT Mandi, Mandi, H.P.-175005
Subject: Research Practicum, Advanced Fluid Mechanics

Teaching Experience (continued)

2019 – present **Institute Teaching Assistant**, IIT Bombay, Mumbai-400076
Subject: Computational Methods for Thermal and Fluid Engineers (CMTFE), Fluid-Structure Interaction, Makerspace, Fluid Dynamics

Research Publications

Journal Articles

- 1 A. K. Pandey, **G. Sharma**, and R. Bhardwaj, “Flow-induced reconfiguration and cross-flow vibrations of an elastic plate and implications to energy harvesting,” *Journal of Fluids and Structures*, vol. 122, p. 103 977, 2023.
- 2 **G. Sharma** and R. Bhardwaj, “Flow-induced vibrations of elastically coupled tandem cylinders,” *Journal of Fluid Mechanics*, vol. 976, A22, 2023.
- 3 **G. Sharma**, H. Garg, and R. Bhardwaj, “Flow-induced vibrations of elastically-mounted c-and d-section cylinders,” *Journal of Fluids and Structures*, vol. 109, p. 103 501, 2022.
- 4 **G. Sharma**, A. K. Pandey, and R. Bhardwaj, “Effect of shape of frontbody and afterbody on flow past a stationary cylinder at $re= 100$,” *Physics of Fluids*, vol. 34, no. 6, 2022.
- 5 V. Kumar, H. Garg, **G. Sharma**, and R. Bhardwaj, “Harnessing flow-induced vibration of a d-section cylinder for convective heat transfer augmentation in laminar channel flow,” *Physics of Fluids*, vol. 32, no. 8, 2020.
- 6 S. Yadav, **G. Sharma**, S. Nag, and A. Gupta, “Reverberation time improvement of lecture auditorium: A case study,” *Noise & Vibration Worldwide*, vol. 49, no. 1, pp. 14–19, 2018.


Conference Proceedings

- 1 **G. Sharma** and R. Bhardwaj, “Effect of elastic coupling on flow-induced vibration (fiv) of elastically mounted tandem cylinders,” APS, 2023.
- 2 A. Pandey, **G. Sharma**, and R. Bhardwaj, “Dynamic response of a cantilevered flexible vertical plate in a uniform inflow at $re = 100$,” in *Fluid Mechanics and Fluid Power*, Roorkee, Uttarakhand, India: Springer, 2022.
- 3 A. Pandey, **G. Sharma**, and R. Bhardwaj, “Flow-induced vibrations of a cantilevered flexible vertical plate,” in *75th Bulletin of the American Physical Society, Division of Fluid Dynamics*, Indianapolis, Indiana, USA: APS, 2022.
- 4 **G. Sharma** and R. Bhardwaj, “Effect of frontbody and afterbody on flow-induced vibration of a cylinder,” in *75th Bulletin of the American Physical Society, Division of Fluid Dynamics*, Indianapolis, Indiana, USA: APS, 2022.
- 5 **G. Sharma** and R. Bhardwaj, “Effect of spacing on viv response of elastically coupled cylinders in side-by-side configuration,” in *Fluid Mechanics and Fluid Power*, Roorkee, Uttarakhand, India: NSFMP, 2022.
- 6 **G. Sharma** and R. Bhardwaj, “An immersed boundary method based fluid-structure interaction solver with applications in energy harvesting,” in *Proceedings of 14th WCCM-ECCOMAS Congress*, 2020.






Books and Chapters

- 1 **G. Sharma** and A. Gupta, “Random excitation technique for measurement of acoustic properties,” in *Modeling and Simulation in Industrial Engineering*, M. Ram and J. P. Davim, Eds., Springer, 2018, pp. 29–55.






Academic Projects

- 2021  **OpenMP and CUDA Implementation to Multigrid Poisson Solver**, with Device Specific Customization, and Application to 3D Heat Transfer
The solver checks which processor is the fastest and assigns that processor as master node. A comparative optimization of OpenMP vs CUDA is performed to minimize the runtime.







Internships/Workshops

- 2023  **COMSOL Multiphysics Intensive Online Training Course**, Virtual
- 2019  **Short Term Course on High Performance Computing**, IISc Bangalore, *Bengaluru-560012*
- 2017  **Finite Element Methods in Engineering**, Global Initiative of Academic Networks(GIAN) Course, GJUST, *Hisar, Haryana-125001*
- 2013  **Foundation Course in CATIA**, CaddPrimer, *Chandigarh-160022*
-  **Embedded System Design and Programming using Arduino Platform**, NetMax Technologies Pvt. Ltd., *Chandigarh-160022*



Skills

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|----------------|---|--|
| Languages |  | Strong reading, writing and speaking competencies in English, Hindi. |
| Coding |  | MATLAB, FORTRAN, C/C++, OpenMPI, Mathematica |
| Experimental |  | LabVIEW, NI cDAQ, PCB accelerometers, GRAS microphones, Arduino |
| Postprocessing |  | Python, Tecplot |
| Softwares |  | CATIA, SolidWorks, COMSOL Multiphysics, gmsh |




Awards and Achievements

- 2023  **Best Poster Presentation Award**, PMRF Symposium, IIT Madras.
- 2022  **Appreciation letter** by Prof. Michael P. Paidoussis, ME, McGill University for my work on effects of frontbody and afterbody on FIV
- 2018  **Prime Minister Research Fellowship (PMRF)**, Govt. of India
- 2017  **Best Teaching Assistant (TA)**, IIT Mandi.
- 2013  **99+ percentile**, MENSA India (High IQ Society)
- 2011  **209 rank**, 4th International Mathematics Olympiad.

Community Service

-  Volunteered for teaching underprivileged children at Literacy Mission, NIT Hamirpur from 2012-15.
-  Volunteered for community service at Bridge School program from 2016-17 at IIT Mandi.

Miscellaneous

-  Involved in the maintenance of Lab facility for high-performance computing.
-  Qualified **GATE (ME) 2015** with score **721** and **GATE (ME) 2018** with score **750**.
-  Designed Chassis for collegiate SAE team GATI of NIT Hamirpur for SUPRA 2014.

References

Prof. Rajneesh Bhardwaj (Ph.D. Supervisor)

Professor, Mechanical Engineering Department, IIT Bombay, India

Email: rajneesh.bhardwaj@iitb.ac.in, *Phone:* (+91) 22 - 2576 7534

Prof. Arpan Gupta (M.S. Supervisor)

Associate Professor, Mechanical Engineering Department, IIT Delhi, India

Email: arpan.gupta@mech.iitd.ac.in, *Phone:* (+91) 11 - 2659 1126

Prof. Amit Agrawal (APC Chairperson)

Professor, Mechanical Engineering Department, IIT Bombay, India

Email: amit.agrawal@iitb.ac.in, *Phone:* (+91) 22 - 2576 7516