Faculty Profile

Name : Prasanta Kumar Samal
Designation : Assistant Professor
Department : Mechanical Engineering
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About me:

Prasanta Kumar Samal is an Assistant Professor in the Department of Mechanical Engineering at **The National Institute of Engineering**. He received his Master's degree from **Indian Institute of Science** and completed his Ph.D. in Mechanical Engineering with research focused on vibration-based condition monitoring of anti-friction bearings using machine learning.

Prior to joining academia, he served as Deputy Manager in the Computer Aided Engineering (CAE) division at Mahindra Research Valley, the **R&D centre** of **Mahindra & Mahindra**. His research interests include structural health monitoring, vibration analysis of rotating machinery, dynamic modeling, multibody simulation, finite element analysis, and experimental modal analysis.

He has authored **many Scopus-indexed publications**, including several in SCIE and ESCI journals. He served as Principal Investigator for **two TIH IoT CHANAKYA Fellowships** funded by **DST, Government of India**, totalling ₹9.6 lakhs. He is a **Gold Medallist from** Veer Surendra Sai University of Technology and secured **AIR 26 in GATE 2009**.

Qualification:
B.Tech. (VSSUT), ME (IISc), Ph.D. (JSSSTU)

Courses Taught:

Theory of Machines
Finite Element Analyses
Numerical Methods using MATLAB
Control Engineering
Dynamics and Vibration of Machines
Computer Simulation of Machines

Publications:

Journal Publications:

[1] **P. Samal**, R. R. Srinidhi, I. Jamadar, and V. Baligar, "A comparative analysis of machine learning algorithms for fault classification in cylindrical roller bearings," *FME Trans.*, vol. 53, no. 4, pp. 681–692, 2025, doi: 10.5937/fme2504681K.

[2] **P. K. Samal**, R. Srinidhi, P. K. Malik, H. J. Manjunatha, and I. M. Jamadar, "Benchmarking Machine Learning Algorithms for Bearing Fault Classification Using Vibration Data: A Deployment-Oriented Study," *IEEE Access*, vol. 13, pp. 113984–114002, 2025, doi: 10.1109/ACCESS.2025.3581711.

[3] **P. Samal**, K. Sunil, I. Jamadar, and R. Srinidhi, "Ai-enhanced fault diagnosis in rolling element bearings: A comprehensive vibration analysis approach," *FME Trans.*, vol. 52, no. 3, pp. 450–460, 2024, doi: 10.5937/fme2403450S.

[4] Jamadar, A. Patil, **P. Samal**, and B. Suresha, "An empirical model integrating dimensional analysis and Box-Behnken design for crack detection in rotor fan blades," *FME Trans.*, vol. 52, no. 1, pp. 45–56, 2024, doi: 10.5937/fme2401045J.

[5] M. Jamadar, P. Kamate, and **P. K. Samal**, "Evaluation of fatigue characteristics of 3D printed/composites reinforced with carbon fiber using design of experiments," *Polym. Compos.*, vol. 45, no. 18, pp. 17134–17149, Dec. 2024, doi: 10.1002/pc.28958.

[6] Jamadar, I. M., R. Nithin, S. Nagashree, VR Prajwal Prasad, M. Preetham, **P. K. Samal**, and Shekhar Singh, "Spur Gear Fault Detection Using Design of Experiments and Support Vector Machine (SVM) Algorithm," *J. Fail. Anal. Prev.*, vol. 23, no. 5, pp. 2014–2028, Oct. 2023, doi: 10.1007/s11668-023-01742-4.

[7] M. Jamadar, B. Suresha, **P. Kumar Samal**, and S. A. I. Bellary, "Dimensional Amplitude Response Analysis of Vibrations Produced by Defects in Rolling Contact Bearings," *Sound&Vibration*, vol. 56, no. 2, pp. 165–191, 2022, doi: 10.32604/sv.2022.015267.

[8] **P. Kumar Samal**, I. S. Pruthvi, and B. S. Suresh, "Effect of fiber orientation on vibration response of glass epoxy composite beam," *Mater. Today Proc.*, vol. 43, pp. 1519–1525, 2021, doi: 10.1016/j.matpr.2020.09.315.

[9] H. R. Kemparaju and **P. K. Samal**, "Experimental Investigations on Free Vibration of Plates," *J. Test. Eval.*, vol. 47, no. 4, pp. 2750–2764, Jul. 2019, doi: 10.1520/JTE20170569.

[10] Hebbar, S., Shrinidhi D. Kulal, Tajmul Pasha, **Prasanta Kumar Samal**, and K. Gourav, "Numerical and experimental investigation of vibration isolation of three-storied building structure using tuned mass damper," *International Journal of Recent Technology and Engineering (IJRTE)*, vol. 8, no. 1, pp. 141-149, 2019, EID: 2-s2.0-85068485838.

[11] R. K. Sabat, **P. K. Samal**, and M. Ahamed S, "Effect of strain path on the evolution of microstructure, texture and tensile properties of WE43 alloy," *Mater. Sci. Eng. A*, vol. 715, 2018, doi: 10.1016/j.msea.2018.01.018.

[12] **P. K. Samal**, P. K. Malik, A. Babu, and G. C. Shanthakumar, "Fabrication and Experimentation of a Cantilever Beam Based Piezoelectric Actuator and Sensor for Vibration Energy Harvesting," *Appl. Mech. Mater.*, vol. 592–594, pp. 2297–2302, Jul. 2014, doi: 10.4028/www.scientific.net/AMM.592-594.2297.

Conference Proceedings:

[1] **P. K. Samal**, K. Sunil, I. M. Jamadar, M. Kowshik, and R. Srinidhi, "Fault Classification in Rolling Element Bearing Based on Vibration Signature Using Artificial Neural Network," in *Intelligent Control, Robotics, and Industrial Automation*, vol. 1220, S. Suresh, S. Lal, and M. S. Kiran, Eds., in Lecture Notes in Electrical Engineering, vol. 1220. , Singapore: Springer Nature Singapore, 2024, pp. 521–533. doi: 10.1007/978-981-97-4650-7_38.

[2] E. Ahamed, **P. K. Samal**, B. S. Suresh, and H. R. Kemparaju, "Artificial Neural Network-Based Prediction of Cutting Parameters from Tool Vibration and Forces," in *Advances in Smart Grid Automation and Industry 4.0*, vol. 693, M. J. B. Reddy, D. Kr. Mohanta, D. Kumar, and D. Ghosh, Eds., in Lecture Notes in Electrical Engineering, vol. 693. , Singapore: Springer Singapore, 2021, pp. 199–211. doi: 10.1007/978-981-15-7675-1_19.

[3] H. K. Jayavardhan and **P. Kumar Samal**, "Effect of Shape of Cut-out on Natural Frequency of Square Plate," *IOP Conf. Ser. Mater. Sci. Eng.*, vol. 1189, no. 1, p. 012028, Oct. 2021, doi: 10.1088/1757-899X/1189/1/012028.

[4] K. Gurukiran and **P. Kumar Samal**, "Experimental determination of mode shapes of a plate using speaker as excitation device," *IOP Conf. Ser. Mater. Sci. Eng.*, vol. 1189, no. 1, p. 012029, Oct. 2021, doi: 10.1088/1757-899X/1189/1/012029.

[5] C. Amara Chandra and **P. K. Samal**, "Experimental determination of mode shapes of beams by roving impact test," *Mater. Today Proc.*, vol. 46, pp. 9159–9163, 2021, doi: 10.1016/j.matpr.2020.01.119.

[6] **P. K. Samal**, B. Murali, Abhilash, and T. Pasha, "Finite Element Analysis of Connecting Rod of IC Engine," *MATEC Web Conf.*, vol. 34, p. 02004, 2015, doi: 10.1051/matecconf/20153402004.

[7] Malik, Pramod Kumar, **Prasanta Kumar Samal**, and Amulya Ratna Swain, "Jacobian Based Kinematic and Static Analysis of Over-Constrained Mechanisms with Prismatic and Revolute Joints," in *1st International and 16th National Conference on Machines and Mechanisms, iNaCoMM*, 2013, EID: 2-s2.0-84997419064.

Book Chapters:

[1] M. M. Jamadar, **P. K. Samal**, and I. M. Jamadar, "Effect of Disc Offset Distance on Transverse and Torsional Vibration of Rotor Shaft," in *Intelligent Technologies for Scientific Research and Engineering*, S. Kannadhasan, R. Nagarajan, K. Pal, A. Karthick, and K. K. Saravanan, Eds., BENTHAM SCIENCE PUBLISHERS, 2023, pp. 133–139. doi: 10.2174/9789815079395123010015.

[2] C. Naik, **P. K. Samal**, B. Hulugappa, B. Suresha, I. M. Jamadar, and P. K. Malik, "Effect of Filler Material Type on Dynamic Behaviour of Composite Beams; an Experimental Study," in *Intelligent Technologies for Scientific Research and Engineering*, S. Kannadhasan, R. Nagarajan, K. Pal, A. Karthick, and K. K. Saravanan, Eds., BENTHAM SCIENCE PUBLISHERS, 2023, pp. 147–154. doi: 10.2174/9789815079395123010017.

[3] Aravind, S. L., H. P. Bharath, B. Suresha, B. Harshavardhan, Imran M. Jamadar, **P. K. Samal**, and A. Anand, "Experimental Investigations on the Effect of Carbon Nanotubes and Nanoclay Additives on Thermo-Kinetics and Mechanical Characteristics of Acrylonitrile Butadiene Styrene (ABS)," in *Proceedings of the International Symposium on Lightweight and Sustainable Polymeric Materials (LSPM23)*, vol. 32, S. Mavinkere Rangappa and S. Siengchin, Eds., in Springer Proceedings in Materials, vol. 32. , Singapore: Springer Nature Singapore, 2023, pp. 291–303. doi: 10.1007/978-981-99-5567-1_22.

Other achievements:

Sponsored Research Projects

1 **Digital Twin and Predictive Maintenance of Pneumatic System**, funded by DST through Indian Institute of Technology Bombay under TIH-IoT, duration: March 2023 – March 2024. Role: **Principal Investigator**.
2 **Design and Fabrication of Onion Harvester**, funded by DST through Indian Institute of Technology Bombay under TIH-IoT, duration: March 2023 – March 2024. Role: **Principal Investigator**.

Professional Membership

Life Member, Indian Society for Technical Education.

Industry Experience

Served as **Deputy Manager, Computer Aided Engineering (CAE) – Centre of Excellence** at **Mahindra Research Valley**, the R&D centre of **Mahindra & Mahindra**, contributing to advanced simulation-driven engineering analysis and product development for automotive and farm equipment systems.

Awards and Recognitions

- **Gold Medalist** in B.Tech in Mechanical Engineering from Veer Surendra Sai University of Technology (2009).
- Secured **All India Rank 26** in the **Graduate Aptitude Test in Engineering**, 2009.

Areas of Research Expertise

- Vibration-based Structural Health Monitoring
- Condition Monitoring of Rotating Machinery using Machine Learning
- Dynamic Modeling and Multibody Simulation
- Finite Element Analysis (FEA)
- Experimental Modal Analysis

Technical Skills

- MATLAB
- LabVIEW
- ADAMS (Multibody Dynamics)
- Finite Element Modelling and Simulation Tools

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