

# RANJAN BHATTACHARYYA

## Education:

1987 Ph.D. Department of Engineering Mechanics, University of Kentucky, Lexington, USA.

Dissertation: Some Dynamical Problems in Nonlinear Continuum Mechanics involving Rubber elasticity.

1983 M.Tech. Department of Mechanical Engineering, I.I.T. Kharagpur.  
Thesis: Stability of Rotor-Journal bearing System with Viscoelastic Polymeric Lubricants.

1981 B.Tech. (Hons.) Department of Mechanical Engineering, I.I.T. Kharagpur.

1976 Higher Secondary Examination, Rama Krishna Mission, Rahara, West Bengal.

## Positions Held and Experience:

1982–1987 Teaching and Research Assistant, Department of Engineering Mechanics, Univ. of Kentucky, Lexington, USA.

1987-1988 Post Doctoral Fellow and Instructor, Department of Engineering Mechanics, Univ. of Kentucky, Lexington, USA.

Responsibilities: Carrying out further work in Nonlinear Continuum Mechanics and Teaching UG courses.

1988- 1990 Visiting Assistant Professor, University of Pittsburgh, Bradford, USA.

Responsibilities: Teaching courses in Mechanical Engineering.  
Research work done on the Hill's Equation.

1990- 1996 Assistant Professor, Department of Mechanical Engineering, I.I.T. Kharagpur.

*Areas of Interest*: Smart Structures, Active Magnetic Bearing-Rotor Systems, Linear and Nonlinear Vibrations.

1996- 2003 Associate Professor, Department of Mechanical Engineering, I.I.T Kharagpur.

*Areas of Interest*: Linear and Nonlinear Vibrations, Nonlinear Dynamical Problems in Rubber Elasticity, Active Magnetic Bearings.

2003- 2010 Professor, Department of Mechanical Engineering, I.I.T Kharagpur.

*Areas of Interest:* Linear & Nonlinear Vibrations, Nonlinear Dynamical Problems in Rubber Elasticity, Rotor Dynamics, Dynamics of systems with non-ideal drive.

2010 – 2013 Professor and Head, Mechanical Engineering Department, I.I.T. Kharagpur.  
*Areas of Interest:* Nonlinear Vibrations, Nonlinear Dynamical Problems in Rubber Elasticity, Rotor Dynamics, Dynamics of systems with non-ideal drive.

2013- Present Professor, Department of Mechanical Engineering, I.I.T. Kharagpur.  
*Areas of Interest:* Non-ideal drive system interactions, Shape memory Alloy Oscillators, Elastic waves in solids.

2021 – 2023 Professor and Chairman GATE-JAM, **Organizing Chair** GATE 2022.

2021 – Present Professor (HAG), Department of Mechanical Engineering, IIT Kharagpur (On extension of service till June 2025).  
*Areas of Interest:* Linear and Nonlinear Vibrations, Nonlinear Dynamical Systems in Rubber Elasticity, Drive & Vibrating System interactions, Electro-active polymer dynamics.

### **Professional Experience:**

**Teaching:** Vibration Analysis, Active Vibration Control, Classical and Modern Control Theories, Digital Control, Mechanics (statics and deformable solids), Mechatronics, Nonlinear Vibration, Vibration Control and Isolation, Dynamics of Machines, Design and Dynamics laboratory, Microprocessor Application Laboratory, Stress Analysis Laboratory.

**Current Research:** Finite Elasticity, Rotor Dynamics, Sommerfeld Effect in Non-ideal Oscillators, Electro-active polymer structures.

### **Guidance:**

Ph.D.: **20** (completed), **1** (Submitted), **1** (On-going)

M.Tech. **70** (approx.)

**Research Publications: 69**

**Conference Publications: 20** (Only 10 are listed)

### **Major Sponsored Projects/Consultancies:**

1. Development of Quartz Micro-machined Gyro-Chips, 1995 (30 months), DRDL, Hyderabad.
2. Vibration Control of Flexible Rotors by Active Magnetic Bearings, 1996 (36

- months), CSIR.
3. Dynamics and Stress Analysis of Cryo-Arm System of 2<sup>nd</sup> Launch Pad, Sriharikota, 2000 (24 months), ISRO, SHAR Center, **This is in operation now.**
  4. Technology Development of Liquid Spring Shock Isolation System (LSIS), 2006, Research & Development Establishment (Engineers), DRDO, Pune.
  5. Bond graph modeling and dynamics of dual spool gas turbine rotor, 2003 (12 months) GTRE, DRDO, Bangalore.
  6. Setting up a Research and Development Center for Damodar Valley Corporation at Kolkata, 2008 (60 months), DVC.
  7. Development of System for Monitoring of Slow Speed Running Equipment, 2008 (9 months), RDCIS, SAIL. **This is in operation now.**
  8. Development of System for Monitoring of Slow Speed Running Equipment for Field Applications, 2011 (18 Months), RDCIS, SAIL. **This is in operation now.**
  9. High Speed Train Suspension and Bogie Technology, 2014 (36 Months), RDSO, Lucknow.
  10. Vibration Fault diagnosis in Thermal power Plants in DVC and WBPDCCL at Various Locations.

**Other Information:**

1. Member of faculty selection committees in IITs and NITs.
2. Member of the Selection Committee for CSIR, DRDO Scientists.
3. Reviewer of JSV, IOP, JVC, Int. J. non-Linear Mechanics, Physics Letters A, Nonlinear Dynamics, International Journal of Mechanical Sciences, IEEE
4. Reviewer of Several Governmental project proposals in India and Sultan Qaboos University, Muscat.
5. Video Course Contributor for NPTEL I and Subject coordinator for NPTEL II.
6. Member ASME: 11 Years.
7. Head, Mechanical Engineering, IIT Kharagpur: 3 years.
8. Chairman, GATE-JAM, IIT Kharagpur: 3 Years.
9. Rector's Nominee: Technology Students' Gymkhana, 9 Years.

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## Journal Publications

1. Behera, S.K., **Bhattacharyya, R.** and Sarangi, S., “A unified physics-based continuum theory for magnetorheological fluid deformation: Implications in magnetorheological fluid-based brake applications”, *Physics of Fluids*, Vol. 37 (2), **10.1063/5.0248093**, 2025, AIP Publishing. **4.1**
2. Ranjan, R.A., Sarangi, S., **Bhattacharyya, R.**, “Nonlinear dynamics of a dielectric actuator: Exploring electrode mechanics,” *International Journal of Mechanical Sciences* Vol. 283, 10.1016/j.ijmecsci.2024.109755, 2024, Elsevier. **12.8**
3. Behera, S.K., Ranjan, R.A., Sarangi, S., Samantaray, A.K. and **Bhattacharyya, R.**, “Emergence of chaos and its control in a dissipative dielectric elastomeric membrane system under periodic loads”, *Journal of Sound and Vibration*, Vol. 577, 10.1016/j.jsv.2024.1183282024, Elsevier. **4.3**
4. Behera, S.K., Ranjan, R.A., Sarangi, S. and **Bhattacharyya, R.**, “Nonlinear dynamics and chaos control of circular dielectric energy generator,” *Communications in Nonlinear Science and Numerical Simulation*, Vol. 128, 10.1016/j.cnsns.2023.107608, 2024, Elsevier. **3.4**
5. Behera, S.K., Ranjan, R.A., Kumar , D., Sarangi, S. and **Bhattacharyya, R.**, “Dynamic modelling and analysis of a biological circular membrane,” *International Journal of Engineering Science*, Vol. 188, j.ijengsci.2023.103864, 2023, Elsevier. **5.7**
6. Chakraborty, P., Chakraborty, G. and **Bhattacharyya, R.**, “Dynamics of a non-ideally driven oscillating system under frictional slip,” *Journal of Vibration and Control*, Vol. 30, pp. 5298 – 5308, 2023, Sage. **2.6**
7. Keki, P., Dasgupta, A. and **Bhattacharyya, R.**, “Interaction of waves with a sliding viscoelastic layer,” *Waves in Random and Complex Media*, Vol. 34 (5), 10.1080/17455030.2021.1989080, 2021, Taylor and Francis. **4.051**
8. Bharti, S.K., Sinha, A., Samantaray, A.K. and **Bhattacharyya, R.**, “Dynamics of a rotor shaft driven by a Non-ideal source through a universal joint,” *Journal of Sound and Vibration*, Vol. 499, 10.1016/j.jsv.2021.115992, 2021, Elsevier. **4.3**
9. Kumar, D., Sarangi, S. and **Bhattacharyya, R.**, “Universal relations in nonlinear electro-magneto-elasticity,” *Archive of Applied Mechanics*, Vol. 90, pp. 1643 – 1657, 2020, Springer. **2.1**
10. Bharti, S.K., Sinha, A., Samantaray, A.K. and **Bhattacharyya, R.**, “The Sommerfeld effect of Second Kind: passage through parametric instability in a rotor with non-

circular shaft and anisotropic flexible supports,” *Nonlinear Dynamics*, Vol. 100, pp. 3171 – 3197, 2020, Springer. **5.2**

11. Arya, K., **Bhattacharyya, R.** and Sarangi, S., “Small superimposed radial oscillations for a class of damaged limited elastic tubes,” *Acta Mechanica*, Vol. 232, pp. 2765 – 2780, 2021, Springer. **2.3**
12. Sinha, A., Bharati, S., Samantaray, A.K. and **Bhattacharyya, R.**, “Sommerfeld effect in a single-DOF system with base excitation from motor driven mechanism,” *Mechanism and Machine Theory*, Vol 148, 10.1016/j.mechmachtheory.2020.103808 , 2020, Elsevier. **4.5**
13. Jose, S., Chakraborty, G. and **Bhattacharyya, R.**, “Force transmissibility characteristics of a pseudo-elastic oscillator,” *Journal of Intelligent Materials Systems and Structures*, Vol. 31 (3), pp. 339 – 363, 2020, Sage. **2.4**
14. Arya, K., Sarangi, S. and **Bhattacharyya, R.**, “A Damaged Ogden Material Tube under Pressure: Stability and Bifurcation Analysis,” *Soft Materials*, Vol. 18 (1), pp. 74 – 88, 2020, Taylor and Francis. **2.9**
15. Prakash, O, Samantaray, A.K. and **Bhattacharyya, R.**, “Adaptive Prognosis of Hybrid Dynamical System for Dynamic Degradation Patterns,” *IEEE Transactions Industrial Electronics*, Vol. 67, 10.1109/TIE.2019.2931489, 2019, IEEE Transactions. **7.5**
16. Kekti, P., Dasgupta, A. and **Bhattacharyya, R.**, “Creeping motion characteristics due to bulk wave excitation in an elastic half-space,” *Ultrasonics*, Vol. 96, pp. 232 – 239, 2019, Elsevier. **3.8**
17. Bharti, S., Bisoi, A., Sinha, A., **Bhattacharyya, R.** and Samantaray, A.K. “Sommerfeld Effect at Forward and Backward Critical Speeds in a Rigid Rotor Shaft System with Anisotropic Supports,” *Journal of Sound and Vibration*, Vol. 442, pp. 330 – 349, 2019, Elsevier. **4.3**
18. Prakash, O., **Bhattacharyya, R.** and Samantaray, A.K., “Model-based Diagnosis of Multiple Faults in Hybrid Dynamical Systems with Dynamically Updated Parameters,” *Trans IEEE Systems, Man and Cybernetics*, Vol. 49, pp. 1053 – 1072, 2018. **10.19**
19. Sinha, A., Bharti, S., **Bhattacharyya, R.** and Samantaray, A.K., “Discussion on “A novel approach to study effects of asymmetric stiffness on parametric instabilities of multi-rotor-system” by Jain et al., *Journal of Sound and Vibration*, Vol. 413, pp. 159 – 172, 2018,” Vol. 442, pp. 268 – 280, 2019, Elsevier. **4.3**

20. Kekti, P., Dasgupta, A. and **Bhattacharyya, R.**, "Wave induced sliding at the interface between a layered elastic medium and a half-space," *Meccanica*, Vol. 53, pp. 3399 – 3413, 10.1007/s11012-018-0886-3, 2018, Springer. **2.0**
21. Jose, S., Chakraborty, G. and **Bhattacharyya, R.**, "Equivalent linear stiffness and damping of a shape memory alloy bar operating at isothermal and non-isothermal condition" *Journal of Intelligent Materials Systems and Structures*, Vol. 29, 13, pp. 2709 – 2727, 2018, Sage. **2.4**
22. Pradhan, S., Samantaray, A.K. and **Bhattacharyya, R.**, "Multi-step wear evolution simulation method for the prediction of rail wheel wear and vehicle dynamic performance," *SIMULATION: Transactions of The Society for Modeling and Simulation International*, Vol. 95(5), pp. 441 – 459, 10.1177/0037549718785023, 2019, Sage. **1.3**
23. Sinha, A, Bharati, S., Samantaray, A.K., Chakraborty, G. and **Bhattacharyya, R.**, "Sommerfeld Effect of an oscillator with a reciprocating mass," *Nonlinear Dynamics*, Vol. 93, No. 3, pp. 1719 – 1739, 10.1007.s11071-018-4287-x, 2018, Springer. **5.2**
24. Pradhan, S., Samantaray, A.K. and **Bhattacharyya, R.**, "Prediction of railway wheel wear and its influence on the vehicle dynamics in a specific operating sector of Indian railways network, *WEAR*, Vol. 406 – 407, pp. 92-104, 2018, Elsevier. **5.3**
25. Pradhan, S., Samantaray, A.K. and **Bhattacharyya, R.**, "Application of Semi-Hertzian Approach to Predict the Dynamic Behavior of Railway Vehicles Through a Wear Evolution Model," *Journal of Friction and Wear*, Vol 38, No. 6, pp. 437 – 443, 2017, Springer. **0.6**
26. Bisoi, A., Samantaray, A.K. and **Bhattacharyya, R.**, "Sommerfeld effect in a two-disk rotor dynamic system at various unbalance conditions," *Meccanica*, Vol. 53, No. 4 – 5, pp. 681-701, 2017, Springer. **2.0**
27. Prakash, O., Samantaray A.K. and **Bhattacharyya, R.**, "Model-based Multi-component Adaptive Prognosis for Hybrid Dynamical Systems," *Control Engineering Practice*, Vol. 72,10.1016/j.conengprac.2017.11.003, 2017, Elsevier. **5.4**
28. Bisoi, A, Samantaray, A. K. and **Bhattacharyya, R.**, "Control Strategies for DC Motors Driving Rotor Dynamic Systems through Resonance," *Journal of Sound and Vibration*, Vol. 411, pp. 304–327, 2017, Elsevier. **4.3**
29. Kekti, P., Dasgupta A. and **Bhattacharyya R.**, "On the surface motion characteristics in a single layered half-space excited by bulk waves, *Acta Mechanica*, Vol. 228, No. 9, pp. 3329 – 3344, 2017, Springer. **2.3**

30. Jose, S, Chakraborty, G and **Bhattacharyya, R.**, “Coupled thermo-mechanical analysis of a vibration isolator made of shape memory alloy,” *International Journal of Solids and Structures*, Vol. 115 – 116, pp. 87 -103, 2017 Elsevier. **3.4**
31. Bisoi, A., Samantaray, A.K. and **Bhattacharyya, R.**, “Sommerfeld effect in a gyroscopic overhung rotor-disk system,” *Nonlinear Dynamics*, Vol. 88, pp. 1565–1585, 10.1007/s11071 – 017 – 3329 – 0, 2017, Springer. **5.2**
32. **Bhattacharyya, R.**, Sarangi, S. and Samantaray, A.K., “Effect of Stress-softening on the Ballooning Motion of Hyperelastic Strings,” *International Journal of Engineering Science*, Vol. 96, pp. 19 – 33, 2015, Elsevier. **5.7**
33. Karthikeyan, M, Bisoi, Alfa, Samantaray, A.K. and **Bhattacharyya, R.**, “Sommerfeld effect characterization in rotors with non-ideal drive from ideal drive response and power balance,” *Mechanism and Machine Theory*, Vol. 91, pp. 269 – 288, 2015, Elsevier. **4.5**
34. Samantaray, A. K., Dasgupta, S.S. and **Bhattacharyya, R.**, “Bond Graph Modeling of an Internally Damped Nonideal Flexible Spinning Shaft,” *ASME Journal of Dynamic Systems, Measurement, and Control*, Vol. 132, pp. 061502 – 1 – 061502 – 9 2010, ASME. **1.7**
35. Manna, M. C., **Bhattacharyya, R.** and Sheikh, A. H, “Nonlinear dynamic response and its control of rubber components with piezoelectric patches/layers using finite element method,” *Journal of Smart Structures and Systems*, Vol. 6, pp. 889 – 903, 2010, Techno Press. **2.1**
36. Dasgupta, S. S., Samantaray, A. K. and **Bhattacharyya, R.**, “Stability of an Internally Damped non-Ideal flexible Spinning Shaft,” *International Journal of non-Linear Mechanics*, Vol. 45, pp. 286 – 293, 2010, Elsevier. **3.34**
37. Samantaray, A. K., Dasgupta, S. S. and **Bhattacharyya, R.**, “Sommerfeld Effect in Rotationally Symmetric Planar Dynamical Systems,” *International Journal of Engineering Science*, Vol. 48, pp. 21 – 36, 2010, Elsevier. **5.7**
38. Ray, M. C., Faye. A., Patra S. and **Bhattacharyya, R.**, “Theoretical and Experimental Investigations on the Active Structural-Acoustic Control of a Thin Plate using a Vertically Reinforced 1-3 piezoelectric Composite,” *Smart Materials and Structures*, Vol. 18, No.1, p. 015012, 2009, IOP Science. **3.7**
39. Beatty, M. F., **Bhattacharyya, R.** and Sarangi, S., “Small Amplitude, Free Longitudinal Vibrations of a Load on a Finitely Deformed Stress-softening Spring with Limiting Extensibility,” *ZAMP*, Vol. 60, pp. 971 – 1006, 2009, Springer. **1.8**

40. Banerjee, N., Saha, A. K., Karmakar, R. and **Bhattacharyya, R.**, “Bond Graph Modeling of a Railway Truck on Curved Track,” *SIMPRA*, Vol. 17, pp. 22 – 34, 2009, Simulation Society. **3.5**
41. Manna, M. C., Sheikh, A. H. and **Bhattacharyya, R.**, “Static Analysis of Rubber Components with Piezoelectric Patches using Nonlinear Finite Element,” *Journal of Smart Structures and Systems – an International Journal*, Vol. 5, pp. 23 – 42, 2009, Techno Press. **2.1**
42. Sarangi, S., **Bhattacharyya, R.** and Beatty M. F., “Effect of stress-softening on the dynamics of a load supported by a rubber string,” *J. Elasticity*, Vol. 92, pp. 115 – 149, 2008, Springer. **1.8**
43. Samantaray, A. K., **Bhattacharyya, R.** and Mukherjee, A., “On the stability of Crandall Gyro-pendulum,” *Physics Letters A*, Vol. 372, No.3, pp. 238 – 243, 2008, IOP Science. **2.6**
44. Samantaray, A. K., Mukherjee, A. and **Bhattacharyya, R.**, “Some Studies on Rotors with Polynomial Type Non-linear External and Internal Damping,” *International Journal of Non-Linear Mechanics*, Vol. 41, No. 9, pp. 1007 – 1015, 2007, Elsevier. **3.34**
45. Manna, M. C., Sheikh, A. H. and **Bhattacharyya, R.**, “A Compressible Finite Element Model for Hyperelastic Members under Different Modes of Deformation,” *Structural Engineering and Mechanics – an International Journal*, Vol. 24, No. 2, pp. 227 – 245, 2006, Techno Press. **2.2**
46. Samantaray, A. K., **Bhattacharyya, R.** and Mukherjee, A., “An Investigation into the Physics behind the Stabilizing Effects of Two-Phase Lubricants in Journal Bearings,” *Journal of Vibration and Control*, Vol. 12, No. 4, pp. 425 – 442, 2006, Sage. **2.6**
47. **Bhattacharyya, R.**, Mukherjee, A. and Samantaray A. K., “Harmonic Oscillations of Linear Non-conservative Systems with Two Degrees of Freedom”, *Journal of Sound and Vibration*, Vol. 264, No. 4, pp. 973 – 980, 2003, Elsevier. **4.3**
48. **Bhattacharyya, R.**, Jain, P and Nair, A., “Normal Mode Localization for a Two Degrees of Freedom System with Quadratic and Cubic Nonlinearities”, *Journal of Sound and Vibration*, Vol. 249, pp. 909 – 919, 2002, Elsevier. **4.3**
49. **Bhattacharyya, R.**, “Behavior of a Rubber Spring Pendulum”, *ASME J. Applied Mechanics*, Vol. 67, pp. 332 – 337, 2000, Trans ASME. **2.6**
50. Ray, M. C., **Bhattacharyya, R.** and Samanta, B., “Exact Solutions for Dynamic Analysis of Composite Plates with Distributed Piezoelectric Layers”, *Computers and Structures*, Vol. 66, No. 6, pp. 737 – 743, 1998, Elsevier. **4.4**

51. Samanta, B., Ray, M. C. and **Bhattacharyya, R.**, “Finite Element Method for Active Control of Intelligent Structures”, *AIAA J.*, Vol. 34, No. 9, pp. 1885 – 1893, 1996, AIAA. **2.9**
52. **Bhattacharyya, R.**, “A Stability Theorem for Hill’s Equation for Engineering Applications”, *ASME J. Vibration and Acoustics*, Vol. 117, pp. 380 – 381, 1995, Trans. ASME. **1.9**
53. Ray, M. C., **Bhattacharyya, R.** and Samanta, B., “Static Analysis of an Intelligent Structure by the Finite Element Method”, *Computers and Structures*, Vol. 52, pp. 617 – 631, 1994, Elsevier. **4.4**
54. Ray, M. C., Bhattacharyya, R. and Samanta, B., “Exact Solutions for Static Analysis of Intelligent Structures”, *AIAA J.*, Vol. 31, pp. 1684 -1691, 1993, AIAA. **2.9**
55. Beatty, M. F. and **Bhattacharyya, R.**, “Poynting Oscillations of a Rigid Disk Supported by Neo-Hookean Rubber Shafts”, *J. Elasticity*, Vol. 24, pp. 135-186, 1990 (Review Appeared in *Applied Mechanics Reviews*, Vol. 44, No. 5, p. J485, 1991.), Springer. **1.8**
56. **Bhattacharyya, R.**, “Stability of the Forced Vibrational Motion of a Vehicular Body Supported by Rubber Shear Mountings”, *International J. Nonlinear Mechanics*, Vol. 24, pp. 467 – 482, 1989, Elsevier. **3.34**
57. Beatty, M. F. and **Bhattacharyya, R.**, “Stability of the Free Vibrational Motion of a Vehicular Body Supported by Rubber Shear mountings with Quadratic Response”, *International J. Nonlinear Mechanics*, Vol. 24, pp. 401 – 414, 1989, Elsevier. **3.34**
58. Mukherjee, A., **Bhattacharyya, R.** and Dasary, A. M., “Theoretical Study of Stability of Rigid Rotors under the Influence of Dilute Viscoelastic Lubricants”, *Trans. ASME, J. Tribology*, Vol. 107, pp. 75 – 81, 1985, Trans. ASME. **2.2**
59. Sarangi, S., Dasbakshi, S., **Bhattacharyya, R.** and Mohanty, A., “Arterial Wall Mechanics – A review,” *Indian Journal of Biomechanics*, Vol. 1(1), pp. 11 – 17, 2007. **2.4**

## Chapters in Edited Volumes

1. Sinha, A., Bharti, S.K., Samantaray, A.K. and **Bhattacharyya, R.**, “Jump Phenomena in a Motor-Driven Quick-Return Mechanism that Excites the Base of a Vibrating Structure,” *Advances in Industrial Machines and Mechanisms*, Book Series: Lecture Notes in Mechanical Engineering, pp. 39 – 49, 2021, Springer.
2. Keki, P., Dasgupta, A. and **Bhattacharyya, R.**, “Propagation of Viscoelastic Waves in a Single Layered Media with a Free Surface,” *Advances in Structural Vibrations*, Book Series: Lecture Notes in Mechanical Engineering, pp. 3 – 10, 2020, Springer.
3. Bisoi, A., Bharti, S.K., Samantaray, A.K. and **Bhattacharyya, R.**, “Sommerfeld Effect Characterization in Anisotropic Non-ideal Rotor System,” *Advances in Rotor Dynamics, Control, and Structural Health Monitoring*, Book Series: Lecture Notes in Mechanical Engineering, pp. 51 – 61, 2020, Springer.
4. Jose, S., Chakraborty, G. and **Bhattacharyya, R.**, “On Reduction of Force Transmission Using Shape Memory Alloy as an Isolator,” *Advances in Rotor Dynamics, Control, and Structural Health Monitoring*, Book Series: Lecture Notes in Mechanical Engineering, pp. 455 – 466, 2020, Springer.
5. Sinha, A., Samantaray, A.K. and **Bhattacharyya, R.**, “Self-synchronization of Two Unbalanced DC Motor-Driven Rotors on a Common Movable Platform,” *Machines, Mechanisms and Robotics*, Book Series: Lecture Notes in Mechanical Engineering, pp. 207 – 217, 2018, Springer.
6. Prakash, O., Samantaray, A.K. and **Bhattacharyya, R.**, “Fault diagnosis and remaining useful life prediction of multiple deteriorating components in hybrid dynamical system,” *Safety and Reliability – Safe Societies in a Changing World*, pp. 977 – 985, 2018, Taylor Francis.
7. Prakash, O., Samantaray, A.K. and **Bhattacharyya, R.**, “Optimal Adaptive Threshold and Mode Fault Detection for Model-Based Fault Diagnosis of Hybrid Dynamical Systems,” *Fault Diagnosis of Hybrid Dynamic and Complex Systems*, pp. 45 – 78, 2018, Springer.
8. Bisoi, A., **Bhattacharyya, R.** and Samantaray, A.K., “Speed Control of 3-Phase Induction Motor in Presence of Sommerfeld Effect,” *Mechanisms and Machine Science*, Book Series, Vol. 44, pp. 169 – 176, 2016, Springer.

9. Gupta, N., Sharma, M., Sarangi, S. and **Bhattacharyya, R.**, “Determination Of Mechanical Property Of Synthetic Rubber Using Optical Mouse As A Vibration Sensor,” *Vibration Problems ICOVP*, Book Series: Springer Proceedings in Physics, Vol. 126, pp. 165 – 171, 2008, Springer.

## Conference Papers

1. Chakraborty, P., Chakraborty, G. and **Bhattacharyya, R.**, “Elimination of the Sommerfeld Effect using Dry friction,” *International Mechanical Engineering Congress and Exposition ASME*, 10.1115/IMECE2019-11172, 2019, Utah, USA.
2. Sinha, A., Bharti, S.K., Samantaray, A.K. and **Bhattacharyya, R.**, “Self-Synchronization in a Class of Motor Driven Reciprocating Mechanisms,” *International Mechanical Engineering Congress and Exposition ASME*, 10.1115/IMECE2019-11092, 2019, Utah, USA.
3. Sinha, A., Bharti, S.K., Samantaray, A.K. and **Bhattacharyya, R.**, “Sommerfeld Effect and Passive Energy Reallocation in a self-Synchronizing System,” *International Mechanical Engineering Congress and Exposition*, ASME10.1115/IMECE2018-87559, 2018, Pittsburgh, USA.
4. Kekti, P, Dasgupta, A. and **Bhattacharyya, R.**, “Analytical studies of imperfect interface subjected to elastic bulk wave,” *25<sup>th</sup> International Congress on Sound and Vibration*, 2018, Hiroshima, Japan.
5. Pradhan, S., Samantaray, A.K. and **Bhattacharyya, R.**, ,”Evaluation of Ride Comfort in a Railway Passenger Vehicle With Integrated Vehicle and Human Body Bond Graph Model,” *International Mechanical Engineering Congress and Exposition ASME*, 10.1115/IMECE2017-71288, 2017, Tampa, USA.
6. Pradhan, S., Samantaray, A.K. and **Bhattacharyya, R.**, “Performance Evaluation of Steering Bogies on Various Tracks,” *ICTACEM*, 2014, IIT Kharagpur.
7. Bisoi, A., Samantaray, A.K. and **Bhattacharyya, R.**, “Sommerfeld effect characterisation in multi-disk rotor dynamic system with non-ideal drive through semi-analytical methods,” *ICTACEM*, 2014, IIT Kharagpur.
8. Mohan, K., Bisoi, A., Samantaray, A.K. and **Bhattacharyya, R.**, “Sommerfeld Effect Characterisation in Rotors with Non-ideal Drive from Ideal Drive Response and Power Balance,” *1st International & 16th National Conference on Machines and Mechanisms (iNaCoMM 2013)*, 10.13140/2.1.2570.6881, 2013, IIT Roorkee.
9. Sarangi, S., **Bhattacharyya, R.** and Samantaray, A.K., “On the Ballooning Motion of Hyperelastic Strings,” *9th International Conference on Vibration Problems*, 2009, IIT Kharagpur.
10. **Bhattacharyya, R.**, “A Stability Criterion for the Mathieu Equation,” *14<sup>th</sup> Biennial Conference on Mechanical Vibration and Noise: Dynamics and Vibration of Time-Varying Systems and Structures*, ASME, 10.1115/DETC1993-0125, 1993, Albuquerque, USA.