Anindya Chatterjee

July 2, 2021

Contact information:

Professor
Department of Mechanical Engineering
Indian Institute of Technology
Kanpur, 208016, India

Email: anindya100@gmail.com, anindya@iitk.ac.in
Phone: (+91) 512 259 6961 (office)
Web: `http://home.iitk.ac.in/~anindya/`

Education:

Cornell University	Theoretical & Applied Mechanics	PhD	1997
University of Florida	Applied Mathematics	MS	1993
University of Florida	Engineering Mechanics	MS	1993
IIT Kharagpur	Mechanical Engineering	BTech	1989

Research interests:

Dynamics and vibrations; material damping and fatigue; applied solid mechanics; hysteresis; systems with delays and fractional order dynamics; statistics of engineering test data.

Teaching:

Statics, dynamics, strength of materials, vibrations, automatic control, stability.

Positions held:

IIT Kanpur	Professor	July 2012-present
IIT Kharagpur	Professor	2009-2012
Indian Institute of Science	Associate Professor	2005-2009
Indian Institute of Science	Assistant Professor	2000-2005
Penn State University	Postdoctoral scholar	1996-2000
TELCO, Jamshedpur	Graduate engineer trainee	1989-1990

Other:

Fellow, Indian National Academy of Engineering (INAE)
Fellow, National Academy of Sciences, India (NASI)
Associate Editor, ASME Journal of Computational and Nonlinear Dynamics, 2016-19
Subject Editor, Nonlinear Dynamics

Book:

Build and Sustain a Career in Engineering. Notion Press, Chennai. 2021.
`https://notionpress.com/read/build-and-sustain-a-career-in-engineering`

Publications:

Journals

1. A. Kumar, M. Nandagopal, K. Laha and A. Chatterjee. Variability in large-sample post-buckling behavior of two small thin walled structures. *Sadhana*, 2021, vol. 46, article no. 51. [DOI: 10.1007/s12046-021-01577-5]
2. S. Tiwari, C. P. Vyasarayani and A. Chatterjee. Data suggest COVID-19 affected numbers greatly exceeded detected numbers, in four European countries, as per a delayed SEIQR model. *Scientific Reports*, 2021, vol. 11, article no. 8106. [DOI: 10.1038/s41598-021-87630-z]
3. S. Tiwari, C. P. Vyasarayani and A. Chatterjee. Performance limit for base-excited energy harvesting, and comparison with experiments. *Nonlinear Dynamics*, 2021, vol 103(1), 197-214. [DOI: 10.1007/s11071-020-06145-w]
4. A. Shirude, C. P. Vyasarayani and A. Chatterjee. Towards design of a nonlinear vibration stabilizer for suppressing single-mode instability. *Nonlinear Dynamics*, 2021, vol. 103(2), 1563-1583. [DOI: 10.1007/s11071-021-06207-7]
5. A. Kumar and A. Chatterjee. Unequivocally nonconservative results from one method of imperfection quantification in RCC-MR. *ASME Journal of Nuclear Engineering and Radiation Science*, 2021, vol. 7(1), 011801. [DOI: 10.1115/1.4047494]
6. C. P. Vyasarayani and A. Chatterjee. Complete dimensional collapse in the continuum limit of a delayed SEIQR network model with separable distributed infectivity. *Nonlinear Dynamics*, 2020, vol. 101(3), 1653-1665. [DOI: 10.1007/s11071-020-05785-2]
7. C. P. Vyasarayani and A. Chatterjee. New approximations, and policy implications, from a delayed dynamic model of a fast pandemic. *Physica D: Nonlinear Phenomena*, 2020, vol. 414, 132701.[DOI: 10.1016/j.physd.2020.132701]
8. S. Tiwari and A. Chatterjee. Basis functions for residual stresses. *Applied Mathematics and Computation*, 2020, vol. 386, 125468. [DOI: 10.1016/j.amc.2020.125468]
9. S. Singla and A. Chatterjee. Nonlinear responses of an SDOF structure with a light, whirling, driven, untuned pendulum. *International Journal of Mechanical Sciences*, 2020, vol. 168, 105305. [DOI: 10.1016/j.ijmecsci.2019.105305]
10. A. Bhattacharjee and A. Chatterjee. Restitution modeling in vibration-dominated impacts using energy minimization under outward constraints. *International Journal of Mechanical Sciences*, 2020, vol. 166, 105215. [DOI: 10.1016/j.ijmecsci.2019.105215]
11. A. Bhattacharjee, K. Shah and A. Chatterjee. Unifying averaged dynamics of the Fokker-Planck equation for Paul traps. *Physics of Plasmas*, 2019, vol. 26(1), 012302. [DOI: 10.1063/1.5063409]
12. A. Kumar and A. Chatterjee. On one imperfection estimation method for thin shell buckling in the design code RCC-MR. *ASME Journal of Nuclear Engineering and Radiation Science*, 2019, vol. 5(4), 042001. [DOI: 10.1115/1.4042117]
13. H. Kanchwala and A. Chatterjee. ADAMS model validation for an all-terrain vehicle using test track data. *Advances in Mechanical Engineering*, 2019, vol. 11(7), 1-18. [DOI: 10.1177/1687814019859784]
14. H. Kanchwala and A. Chatterjee. Rationally derived three-parameter models for elastomeric suspension bushings: theory and experiment. *Journal of Testing and Evaluation*, 2019, vol. 47(2), 1271-1294. [DOI: 10.1520/JTE20170102]
15. A. Bhattacharjee, A. K. Mohanty and A. Chatterjee. Expansion of Preisach density in magnetic hysteresis using general basis functions. *Applied Mathematics and Computation*, 2019, 341, 418-427. [DOI: 10.1016/j.amc.2018.09.009]
16. K. Jose, A. Chatterjee, and A. Gupta. Acoustics of Idakkā: An Indian snare drum with definite pitch. *Journal of the Acoustical Society of America*, 2018, vol. 143(5), 3184-3194. [DOI: 10.1121/1.5038111]
17. A. Bhattacharjee and A. Chatterjee. Transverse impact of a Hertzian body with an infinitely long Euler-Bernoulli beam. *Journal of Sound and Vibration*, 2018, vol. 429, 147-161. [DOI: 10.1016/j.jsv.2018.04.040]

18. S. Biswas and A. Chatterjee. A two-state hysteresis model for bolted joints, with minor loops from partial unloading. *International Journal of Mechanical Sciences*, 2018, vol. 140, 506-520. [DOI: 10.1016/j.ijmecsci.2018.03.021]
19. S. Balija, S. Biswas and A. Chatterjee. Stability aspects of the Hayes delay differential equation with scalable hysteresis. *Nonlinear Dynamics*, 2018, vol. 93(3), 13771393. [DOI: 10.1007/s11071-018-4266-2]
20. S. Dharmadhikari and A. Chatterjee. An engineering-design oriented exploration of human excellence in throwing. *Sadhana*, 2018, vol. 43:28. `http://rdcu.be/IKu6` [DOI: 10.1007/s12046-018-0788-z]
21. S. Maiti, R. Bandyopadhyay and A. Chatterjee. Vibrations of an Euler-Bernoulli beam with hysteretic damping arising from dispersed frictional microcracks. *Journal of Sound and Vibration*, vol. 412, 2018, 287-308. [DOI: 10.1016/j.jsv.2017.09.025]
22. A. Bhattacharjee and A. Chatterjee. Interplay between dissipation and modal truncation in ball-beam impact. *ASME Journal of Computational and Nonlinear Dynamics,* vol. 12(6), 2017, 061018. [DOI: 10.1115/1.4036830]
23. R. Bandyopadhyay, S. Maiti, A. Ghosh and A. Chatterjee. Overhead water tank shapes with depth-independent sloshing frequencies for use as TLDs in buildings. *Structural Control and Health Monitoring*, 2017. [DOI: 10.1002/stc.2049]
24. H. Kanchwala and A. Chatterjee. A generalized quarter car modeling approach with frame flexibility and other nonlocal effects. *Sadhana,* vol. 42(7), 2017, 11751192. [DOI 10.1007/s12046-017-0675-z]
25. S. Biswas, P. Jana and A. Chatterjee. Hysteretic damping in an elastic body with frictional microcracks. *International Journal of Mechanical Sciences,* vol. 108-109, 2016, 61-71. [DOI: 10.1016/j.ijmecsci.2016.01.029]
26. S. Rakshit and A. Chatterjee. Scalar generalization of Newtonian restitution for simultaneous impact. *International Journal of Mechanical Sciences,* vol. 103, 2015, 141-157. [DOI:10.1016/j.ijmecsci.2015.08.019]
27. S. Biswas and A. Chatterjee. A two-state hysteresis model from high-dimensional friction. *Royal Society Open Science,* vol. 2, 2015, 150188. [DOI: 10.1098/rsos.150188]
28. N. Sharma, T. Vimal and A. Chatterjee. Unexpectedly low angular extent of journal bearing pressures: experiment and theory. *Zeitschrift für angewandte Mathematik und Physik (ZAMP),* vol. 66(2), 2015, 455-471. [DOI: 10.1007/s00033-014-0409-6]
29. B. U. Taskar, D. Dasgupta, V. Nagarajan, S. Chakraborty, A. Chatterjee and O. P. Sha. CFD aided modeling of anti-rolling tanks towards more accurate ship dynamics. *Ocean Engineering,* vol. 92, 2014, 296-303. [DOI: 10.1016/j.oceaneng.2014.09.035]
30. P. Jana and A. Chatterjee. Computational prediction of modal damping ratios in thin-walled structures. *Journal of Sound and Vibration,* vol. 333(26), 2014, 7125-7134. [DOI: 10.1016/j.jsv.2014.08.028]
31. A. Chatterjee. A simple wage-talent curve illustrates several aspects of higher technical education. *Current Science,* vol. 107(2), 2014, 189-194.
32. P. Jana and A. Chatterjee. An internal damping formula derived from dispersed elasto-plastic flaws with Weibull-distributed strengths. *International Journal of Mechanical Sciences,* vol. 87, 2014, 137149. [DOI: 10.1016/j.ijmecsci.2014.06.007]
33. S. Biswas and A. Chatterjee. A reduced-order model from high dimensional frictional hysteresis. *Proceedings of the Royal Society of London A,* vol. 470, 2014, 20130817. [DOI: 10.1098/rspa.2013.0817]
34. S. Srivastava and A. Chatterjee. Planar oscillations of a boat in a tank. *International Journal of Mechanical Sciences,* vol. 79, 2014, 152-161. [DOI: 10.1016/j.ijmecsci.2013.11.019]
35. A. Chatterjee. Better rank assignment in multiple-choice entrance exams. *Current Science,* vol. 105(2), 2013, 193-200.
36. S. Das and A. Chatterjee. Numerical stability analysis of linear incommensurate fractional order systems. *ASME Journal of Computational and Nonlinear Dynamics,* vol. 8(4), 2013, 041012:1-6. [DOI: 10.1115/1.4023966]
37. P. Jana and A. Chatterjee. Modal damping in vibrating objects via dissipation from dispersed

frictional microcracks. *Proceedings of the Royal Society of London A,* vol. 469(2152), 2013, Article number 20120685. [DOI: 10.1098/rspa.2012.0685]
38. A. Bhattacharjee and A. Chatterjee. Dissipation in the Bouc-Wen model: small amplitude, large amplitude and two-frequency forcing. *Journal of Sound and Vibration,* vol. 332(7), 2013, 1807-1819. [DOI: 10.1016/j.jsv.2012.10.026]
39. S. Das and A. Chatterjee. Simple recipe for accurate solution of fractional order equations. *ASME Journal of Computational and Nonlinear Dynamics,* vol. 8(3), 2013, 031007:1-7. [DOI: 10.1115/1.4023009]
40. A. Chatterjee and A. Chatterjee. Use of the Fréchet distribution for UPV measurements in concrete. *Nondestructive Testing and Evaluation International,* vol. 52, 2012, 122128. [DOI: 10.1016/j.ndteint.2012.07.003]
41. V. R. Dabiru and A. Chatterjee. A linear S-N curve with load dependent variance and explicit failure probability. *Journal of Testing and Evaluation,* Paper ID: JTE104419, 2012. [DOI: 10.1520/JTE104419]
42. K. Nandakumar, M. Wiercigroch and A. Chatterjee. Optimum energy extraction from rotational motion in a parametrically excited pendulum. *Mechanics Research Communications,* vol. 43, 2012, 7-14. [DOI: 10.1016/j.mechrescom.2012.03.003]
43. V. M. Karanam and A. Chatterjee. Common underlying steering curves for motorcycles in steady turns. *Vehicle System Dynamics,* vol. 49(6), 2011, 931-948. [DOI: 10.1080/00423114.2010.483282]
44. A. Basak, K. Nandakumar and A. Chatterjee. Decoupled three dimensional finite element computation of thermoelastic damping using Zener's approximation. *Meccanica,* vol. 46(2), 2011, 371-381. [DOI: 10.1007/s11012-010-9318-8]
45. S. J. Singh and A. Chatterjee. Unified Galerkin- and DAE-based approximation of fractional order systems. *ASME Journal of Computational and Nonlinear Dynamics,* vol. 6(2), 2011, art. no. 021010. [DOI:10.1115/1.4002516]
46. K. Nandakumar, P. Wahi and A. Chatterjee. Infinite dimensional slow modulations in a delayed model for orthogonal cutting vibrations. *Nonlinear Dynamics,* vol. 62, 2010, 705-716. [DOI: 10.1007/s11071-010-9755-x]
47. S. J. Singh and A. Chatterjee. Beyond fractional derivatives: local approximation of other convolution integrals. *Proceedings of the Royal Society of London A,* vol. 466, 2010, 563 - 581. [DOI: 10.1098/rspa.2009.0378]
48. K. Nandakumar and A. Chatterjee. Nonlinear secondary whirl of an overhung rotor. *Proceedings of the Royal Society of London A,* vol. 466, 2010, 283 - 301. [DOI: 10.1098/rspa.2009.0262]
49. V. R. Dabiru, V. R. Ranganath, U. Ramamurty and A. Chatterjee. Variable stress ratio in cumulative fatigue damage: Experiments and comparison of three models. *Proc. IMechE Part C, Journal of Mechanical Engineering Science,* vol. 224(2), 2010, 271 - 282. [DOI: 10.1243/09544062JMES1579]
50. K. Nandakumar and A. Chatterjee. Continuation of limit cycles near homoclinic points using splines in phase space. *Nonlinear Dynamics,* vol. 57(3), 2009, 383 - 399. [DOI: 10.1007/s11071-008-9449-9]
51. A. Roy and A. Chatterjee. Vibrations of a beam in variable contact with a flat surface. *ASME Journal of Vibration and Acoustics,* vol. 131(4), 2009, 041010. [DOI: 10.1115/1.3086930].
52. I. Chakraborty, A. K. Mohanty and A. Chatterjee. Localized waves along a line of masses on a plate: propagation and sub-exponential attenuation. *Proceedings of the Royal Society of London A,* vol. 464, 2008, 2229-2246. [DOI: 10.1098/rspa.2008.0051]
53. P. Mahadevan, C. S. Jog and A. Chatterjee. Modal projections for synchronous rotor whirl. *Proceedings of the Royal Society of London A,* vol. 464(2095), 2008, 1739-1760. [DOI: 10.1098/rspa.2007.0139]
54. N. Patil, P. Mahadevan and A. Chatterjee. A constructive empirical theory for metal fatigue under block cyclic loading. *Proceedings of the Royal Society of London A,* vol. 464(2093), 2008, 1161-1179. [DOI: 10.1098/rspa.2007.0109]
55. S. J. Singh and A. Chatterjee. DAE-based solution of nonlinear multiterm fractional integrodifferential equations. *Journal Européen des Systèmes Automatisés,* vol. 42(6-8), 2008,

677-688.

56. P. Wahi and A. Chatterjee. Self-interrupted regenerative metal cutting in turning. *International Journal of Non-Linear Mechanics,* vol. 43, 2008, 111-123.
57. R. Mourya and A. Chatterjee. Anomalous frictional behavior in collisions of thin disks revisited. *ASME Journal of Applied Mechanics,* vol. 75, 2008, 024501-3. [DOI: 10.1115/1.2793131]
58. D. Joshi, P. Mahadevan, A. Marathe and A. Chatterjee. Unimportance of geometric nonlinearity in analysis of flanged joints with metal-to-metal contact. *International Journal of Pressure Vessels and Piping,* vol. 84(7), 2007, 405-411.
59. P. K. Tallapragada, A. K. Mohanty, A. Chatterjee and A. G. Menon. Geometry optimization of axially symmetric ion traps. *International Journal of Mass Spectrometry,* vol. 264(1), 2007, 38-52.
60. A. K. Mohanty, K. Chakraborty and A. Chatterjee. A combinatorial optimization problem for high order PODs with few sensors. *ASME Journal of Vibration and Acoustics,* vol. 129(2), 2007, 252-255.
61. P. R. Basu-Mandal, A. Chatterjee and J. Papadopoulos. Hands-free circular motions of a benchmark bicycle. *Proceedings of the Royal Society of London A,* vol. 463, 2007, 1983-2003.
62. N. Rajanbabu, A. Chatterjee and A. G. Menon. Motional coherence during resonance ejection of ions from Paul traps. *International Journal of Mass Spectrometry,* vol. 261, 2007, 159-169.
63. N. Rajanbabu, A. Marathe, A. Chatterjee and A. G. Menon. Multiple scales analysis of early and delayed boundary ejection in Paul traps. *International Journal of Mass Spectrometry,* vol. 261, 2007, 170-182.
64. A. Chatterjee and D. Chatterjee. Analytical investigation of hydrodynamic cavitation control by ultrasonics. *Nonlinear Dynamics,* vol. 46(1-2), 2006, 179-194.
65. S. Gorthi, A. Mohanty and A. Chatterjee. Cantilever beam electrostatic MEMS actuators beyond pull-in. *Journal of Micromechanics and Microengineering,* vol. 16, 2006, 1800-1810.
66. A. Marathe and A. Chatterjee. Asymmetric Mathieu equations. *Proceedings of the Royal Society of London A,* vol. 462 (2070), 2006, 1643-1659.
67. S. J. Singh and A. Chatterjee. Galerkin projections and finite elements for fractional order derivatives. *Nonlinear Dynamics,* vol. 45, 2006, 83-206.
68. A. Marathe and A. Chatterjee. Wave attenuation in weakly nonlinear periodic structures using harmonic balance and multiple scales. *Journal of Sound and Vibration,* vol. 289(4-5), 2005, 871-888.
69. P. Wahi and A. Chatterjee. Asymptotics for the characteristic roots of delayed dynamic systems. *ASME Journal of Applied Mechanics*, vol. 72(4), 2005, 475-483.
70. P. Wahi and A. Chatterjee. Regenerative tool chatter near a codimension-2 Hopf point using mutiple scales. *Nonlinear Dynamics*, vol. 40(4), 2005, 323-338.
71. K. Nandakumar and A. Chatterjee. Higher order pseudoaveraging via harmonic balance for strongly nonlinear oscillations. *ASME Journal of Vibration and Acoustics*, vol. 127(4), 2005, 416-419.
72. A. Chatterjee. Statistical origins of fractional derivatives in viscoelasticity. *Journal of Sound and Vibration*, vol. 284(3-5), 2005, 1239-1245.
73. P. Wahi and A. Chatterjee. Galerkin projections for delay differential equations. *ASME Journal of Dynamic Systems, Measurement and Control*, vol. 127(1), 2005, 80-87.
74. K. Nandakumar and A. Chatterjee. Resonance, parameter estimation, and modal interactions in a strongly nonlinear benchtop oscillator. *Nonlinear Dynamics*, vol. 40(2), 2005, 149-167.
75. S. L. Das and A. Chatterjee. Second order multiple scales for oscillators with large delay. *Nonlinear Dynamics*, vol. 39, 2005, 375-394.
76. A. Chatterjee. Mathematics in Engineering. *Current Science*, vol. 88(3), 2005, 405-414.
77. P. Wahi and A. Chatterjee. Averaging oscillations with small fractional damping and delayed terms. *Nonlinear Dynamics*, vol. 38(1-4), 2004, 3-22.
78. S. J. Singh and A. Chatterjee. Non-intrusive measurement of contact forces during vibration dominated impacts. *ASME Journal of Dynamic Systems, Measurement and Control*, vol. 126(3), 2004, 489-497.
79. K. Nandakumar and A. Chatterjee. The simplest resonance capture problem, using harmonic

balance based averaging. *Nonlinear Dynamics*, vol. 37, 2004, 271-284.
80. A. Chatterjee. The short time impulse response of Euler Bernoulli beams. *ASME Journal of Applied Mechanics*, vol. 71, 2004, 208-218.
81. G. T. Abraham, A. Chatterjee and A. G. Menon. Escape velocity and resonant ion dynamics in Paul trap mass spectrometers. *International Journal of Mass Spectrometry*, vol. 231(1), 2004, 1-16.
82. V. R. Sonti and A. Chatterjee. Acausality alleviation via nonlinear future prediction in feedforward control of vibrations. *International Journal of Acoustics and Vibration*, vol. 8(3), 2003, 181-189.
83. A. Chatterjee. Harmonic balance based averaging: Approximate realizations of an asymptotic technique. *Nonlinear Dynamics*, vol. 32, 2003, 323-343.
84. S. L. Das and A. Chatterjee. Multiple scales via Galerkin projections: Approximate asymptotics for strongly nonlinear oscillations. *Nonlinear Dynamics*, vol. 32, 2003, 161-186.
85. G. T. Abraham and A. Chatterjee. Approximate asymptotics for a nonlinear Mathieu equation using harmonic balance based averaging. *Nonlinear Dynamics*, vol. 31, 2003, 347-365.
86. A. Chatterjee and J. P. Cusumano. Asymptotic parameter estimation via implicit averaging on a nonlinear extended system. *ASME Journal of Dynamic Systems, Measurement and Control*, vol. 125, 2003, 11-18.
87. A. Chatterjee, J. P. Cusumano and D. Chelidze. Optimal tracking of parameter drift in a chaotic system: Experiment and theory. *Journal of Sound and Vibration*, vol. 250(5), 2002, 877-901.
88. D. Chelidze, J. P. Cusumano and A. Chatterjee. Dynamical systems approach to damage evolution tracking, Part 1: The experimental method. *ASME Journal of Vibration and Acoustics*, vol. 124, 2002, 250-257.
89. J. P. Cusumano, D. Chelidze and A. Chatterjee. Dynamical systems approach to damage evolution tracking, Part 2: Model-based validation and physical interpretation. *ASME Journal of Vibration and Acoustics*, vol. 124, 2002, 258-264.
90. A. Chatterjee, R. Pratap, C. K. Reddy and A. Ruina. Persistent passive hopping and juggling is possible even with plastic collisions. *International Journal of Robotics Research*, vol. 21(7), 2002, 621-634.
91. S. L. Das and A. Chatterjee. Multiple scales without center manifold reductions for delay differential equations near Hopf bifurcations. *Nonlinear Dynamics*, vol. 30, 2002, 323-335.
92. S. L. Das and A. Chatterjee. An alternative stability analysis for the simplest walker. *Nonlinear Dynamics*, vol. 28(3), 2002, 273-284.
93. A. Chatterjee. An introduction to the proper orthogonal decomposition. *Current Science*, vol. 78(7), 2000, 808-817.
94. J. P. Cusumano and A. Chatterjee. Steps towards a qualitative dynamics of damage evolution. *International Journal of Solids and Structures*, vol. 37, 2000, 6397-6417.
95. M. Garcia, A. Chatterjee and A. Ruina. Efficiency, speed, and scaling of two-dimensional passive-dynamic walking. *Dynamics and Stability of Systems*, vol. 15(2), 2000, 75-99.
96. M. Garcia and A. Chatterjee. Small slope implies low speed for McGeer's passive walking machines. *Dynamics and Stability of Systems*, vol. 15(2), 2000, 139-157.
97. A. Chatterjee, J. P. Cusumano and J. D. Zolock. On contact-induced standing waves in rotating tires: Experiment and theory. *Journal of Sound and Vibration*, vol. 227(5), 1999, 1049-1081.
98. A. Chatterjee. On the realism of complementarity conditions in rigid body collisions. *Nonlinear Dynamics*, vol. 20, 1999, 159-168.
99. A. Chatterjee. Asymptotic solution for solitary waves in a chain of elastic spheres. *Physical Review E*, vol. 59(5), 1999, 5912-5919.
100. J. Calsamiglia, S. W. Kennedy, A. Chatterjee, A. Ruina and J. Jenkins. Anomalous frictional behavior in collisions of thin disks. *ASME Journal of Applied Mechanics*, vol. 66, 1999, 146-152.
101. A. Chatterjee and A. Ruina. Two interpretations of rigidity in rigid body collisions. *ASME Journal of Applied Mechanics*, vol. 65, 1998, 894-900.

102. A. Chatterjee and A. Ruina. A new algebraic rigid body collision law based on impulse space considerations. *ASME Journal of Applied Mechanics*, vol. 65, 1998, 939-951.
103. M. Garcia, A. Chatterjee, A. Ruina and M. J. Coleman. The simplest walking model: Stability, complexity, and scaling. *ASME Journal of Biomechanical Engineering*, vol. 120, 1998, 281-288.
104. M. J. Coleman, A. Chatterjee and A. Ruina. Motions of a rimless spoked wheel: A simple three-dimensional system with impacts. *Dynamics and Stability of Systems*, vol. 12(3), 1997, 139-160.
105. N. Fitz-Coy and A. Chatterjee. Actuator placement in multi-degree-of-freedom vibration simulators. *Shock and Vibration*, vol. 1(3), 1994, 279-287.

Patent

U.S. patent no. 6,567,752 B2; with J. P. Cusumano and D. Chelidze; through the Penn State Research Foundation. *General method for tracking the evolution of hidden damage or other unwanted changes in machinery components and predicting remaining useful life.* 2003.

Book chapters, conference proceedings/presentations, invited lectures, online reports

1. K. Nandakumar and A. Chatterjee. Nonlinear secondary whirl of an overhung rotor. Presented at the IUTAM Symposium on Nonlinear Dynamics for Advanced Technologies and Engineering Design (NDATED), Aberdeen, UK, July 27-30, 2010.
2. K. Nandakumar and A. Chatterjee. Limit cycle continuation using splines in phase space. Presented at the International Conference on Vibration Problems ICoVP-2009, IIT Kharagpur, January 19-22, 2009.
3. V. M. Karanam and A. Chatterjee. Some procedural details of analysis using ADAMS-Motorcycle. 2008. Available at http://eprints.iisc.ernet.in/17639/
4. K. Nandakumar, P. Wahi and A. Chatterjee. Infinite dimensional slow modulations in a delayed model for orthogonal cutting vibrations. Presented at the 9th ASME Engineering Systems Design and Analysis Conference (ESDA2008), Haifa, Israel, July 7-9, 2008.
5. P. Mahadevan and A. Chatterjee. Axially loaded Timoshenko rotors from a prestressed continuum approach. Presented at the 9th ASME Engineering Systems Design and Analysis Conference (ESDA2008), Haifa, Israel, July 7-9, 2008.
6. N. Patil, P. Mahadevan and A. Chatterjee. Fatigue laws via functional equations. Presented at the 9th ASME Engineering Systems Design and Analysis Conference (ESDA2008), Haifa, Israel, July 7-9, 2008.
7. P. Mahadevan and A. Chatterjee. Some classical buckling problems revisited from a continuum approach. Presented at the 13th National Conference On Mechanisms and Machines (NaCoMM 2007), Bangalore, December 12-14, 2007.
8. S. J. Singh and A. Chatterjee. Three classes of FDEs amenable to approximation using a Galerkin technique. In *Advances in Fractional Calculus: Theoretical Developments and Applications in Physics and Engineering*, Springer, 2007.
9. S. J. Singh and A. Chatterjee. Fractional damping: stochastic origin, and finite approximations. In *Advances in Fractional Calculus: Theoretical Developments and Applications in Physics and Engineering*, Springer, 2007. Also presented at the Fifth EUROMECH Nonlinear Dynamics Conference (ENOC-2005), Eindhoven, The Netherlands, August 7-12, 2005.
10. P. Wahi and A. Chatterjee. Regenerative tool chatter near a codimension-2 Hopf point. Presented at the Twenty-First International Congress of Theoretical and Applied Mechanics, Warsaw, Poland, August 15-21, 2004.
11. P. Wahi and A. Chatterjee. Performance of a Galerkin projection technique for DDEs. Presented at the Tenth Conference on Nonlinear Vibrations, Stability, and Dynamics of Structures, Blacksburg, VA, USA, July 25-28, 2004.
12. K. Nandakumar and A. Chatterjee. Resonance and modal interactions in a strongly nonlinear oscillator. Proceedings of the 8th Cairo University International Conference on Mechanical Design and Production (MDFP-8), Cairo, Egypt, January 4-6, 2004.
13. P. Wahi and A. Chatterjee. Averaging for oscillations with light fractional order damping. Proceedings of the ASME International 19th Biennial Conference on Vibrations and Noise,

Chicago, Illinois, USA, DETC2003/VIB-48386, September 2-6, 2003.
14. P. Wahi and A. Chatterjee. Galerkin projections for delay differential equations. Proceedings of the ASME International 19th Biennial Conference on Vibrations and Noise, Chicago, Illinois, USA, DETC2003/VIB-48570, September 2-6, 2003.
15. P. Wahi and A. Chatterjee. On the characteristic roots of linear, constant coefficient DDEs. Proceedings of the 47th Congress of the Indian Society of Theoretical and Applied Mechanics, IIT Guwahati, December 23-26, 2002.
16. K. Nandakumar and A. Chatterjee. Approximate higher order averaging for strongly nonlinear oscillations via harmonic balance. Presented at the 47th Congress of the Indian Society of Theoretical and Applied Mechanics, IIT Guwahati, December 23-26, 2002.
17. P. K. Gudla, V. R. Sonti and A. Chatterjee. Feedforward control of acausal systems under broadband deterministic forcing. Proceedings of the International Conference on Smart Materials, Structures and Systems (ISSS-SPIE 2002; paper no. SA-570, pp. 566-573), I.I.Sc., Bangalore, December 12-14, 2002.
18. J. P. Singh and A. Chatterjee. Meshless method using global shape functions and Monte Carlo integration for structural dynamics. Presented at the International Conference and Instructional Workshop on Industrial Mathematics, IIT Bombay, Mumbai, December 7-9, 2002.
19. P. Wahi and A. Chatterjee. Computer algebra for characteristic roots of delay differential equations. Presented at the International Conference and Instructional Workshop on Industrial Mathematics, IIT Bombay, Mumbai, December 7-9, 2002.
20. A. Chatterjee. Notes for an invited lecture entitled *Approximate methods for the analysis of nonlinear vibrations, with applications and examples,* as part of a course on Nonlinear Problems in Vibration Engineering, at Research Center Imarat, Hyderabad. 2002.
21. A. Chatterjee and S. L. Das. Stability analysis of the simplest walking machine. Proceedings of the 10th National Conference on Machines and Mechanisms, IIT Kharagpur, pp. 225-232. December 21-22, 2001.
22. A. Chatterjee. On the impulse response of Euler-Bernoulli beams. Proceedings of the 10th National Conference on Machines and Mechanisms, IIT Kharagpur, pp. 457-464. December 21-22, 2001.
23. D. Chelidze, J. P. Cusumano, and A. Chatterjee. Failure prediction using nonlinear short-time prediction and multi-time scale recursive estimation. Proceedings of the 2001 ASME Design Engineering Technical Conferences, 18th Biennial Conference on Mechanical Vibration and Noise, Pittsburgh, Pennsylvania, USA, DETC2001/VIB-21407, September 9-12, 2001.
24. D. Chelidze, J. P. Cusumano and A. Chatterjee. Procedure for tracking damage evolution and predicting remaining useful life with application to an electromechanical experimental system. *Component and Systems Diagnostics, Prognostics, and Health Management*, P. K. Willett, and T. Kirubarajan, eds., Proceedings of SPIE, Vol. 4389, pp. 12-22. 2001.
25. J. P. Cusumano, D. Chelidze and A. Chatterjee. A nonlinear observer for damage evolution tracking. *Integrating Dynamics, Condition Monitoring and Control for the 21st Century*, Starr, A. G., Laung, A. Y. T., Wright, J. R., and Sandoz, D. J., eds., A.A. Balkema, Rotterdam, Brookfield, pp. 61-68. 1999.
26. A. Chatterjee and J. P. Cusumano. Parameter estimation in a nonlinear vibrating system using an observer for an extended system. Proceedings of the 1999 ASME Design Engineering Technical Conferences, 17th Biennial Conference on Mechanical Vibration and Noise, September 12–16, Las Vegas, Nevada, USA, DETC99/VIB-8067. 1999.
27. D. Chelidze, J. P. Cusumano and A. Chatterjee. Hidden variable tracking: formulation and analysis of a mathematical model. Proceedings of the 1999 ASME Design Engineering Technical Conferences, 17th Biennial Conference on Mechanical Vibration and Noise, September 12–16, Las Vegas, Nevada, USA, DETC99/VIB-8358. 1999.
28. A. Chatterjee and A. Ruina. Some general issues in single-point rigid body collision modeling. Presented at Euromech Colloquium 397 on *Impact in mechanical systems*, Grenoble, France, June 30 - July 2, 1999.
29. A. Chatterjee, J. P. Cusumano and D. Chelidze. Study of a chaotic map with application

to parameter tracking in a vibro-impact system. Presented at Euromech Colloquium 397 on *Impact in mechanical systems*, Grenoble, France, June 30 - July 2, 1999.

30. A. Chatterjee, J. P. Cusumano, and D. Chelidze. Tracking parameter drift in a vibro-impact system. Proceedings of the *First International Symposium on Impact and Friction of Solids, Structures and Intelligent Machines*, Ottawa, Ontario, Canada, June 27–30, 1998.
31. A. Chatterjee and A. Ruina. Realizability of arbitrary local mass matrices in single-point rigid body collisions. Proceedings of the *First International Symposium on Impact and Friction of Solids, Structures and Intelligent Machines*, 1998.
32. J. P. Cusumano, D. Chelidze and A. Chatterjee. Tracking damage evolution via delay coordinate embedding. Proceedings of 52nd Meeting of the Machinery Failure Prevention Technology (MFPT) Society, Virginia Beach, VA. April, 1998.
33. J. P. Cusumano and A. Chatterjee. Slowly accumulating damage as a dynamical system. Proceedings of the 52nd Meeting of the Machinery Failure Prevention Technology (MFPT) Society, Virginia Beach, VA. April, 1998.
34. J. P. Cusumano, D. Chelidze, and A. Chatterjee. Experimental Application of a Method for Hidden Parameter Tracking in a Slowly Changing, Chaotic System. Proceedings of the 1997 ASME International Mechanical Engineering Congress and Exhibition, November 16–21, Dallas, TX, TRIB-Vol. 7, pp. 45–54, 1997.
35. D. Chelidze, J. P. Cusumano and A. Chatterjee. Experimental application of a method for hidden parameter tracking in a slowly changing, chaotic system. ASME TRIB-Vol. 7, pp. 45-54. 1997.
36. A. Chatterjee and A. Ruina. Rigid body collision laws: some general considerations. *Applied Mechanics in the Americas*, vol. 4, edited by L. A. Godoy, M. Rysz and L. E. Suarez, pp. 399-402. Proceedings of the Fifth Pan American Congress of Applied Mechanics, San Juan, Puerto Rico. January, 1997.
37. A. Chatterjee and A. Ruina. Some new algebraic rigid-body collision laws. *Applied Mechanics in the Americas*, vol. 4, edited by L. A. Godoy, M. Rysz and L. E. Suarez, pp. 403-406. Proceedings of the Fifth Pan American Congress of Applied Mechanics, San Juan, Puerto Rico. January, 1997.

Past Ph.D. Students:

1. Arindam Bhattacharjee, 2019. IIT Kanpur. Thesis: *New approximations in vibroimpact problems.*
2. S. Biswas, 2018. IIT Kanpur. Thesis: *Low dimensional descriptions of high dimensional frictional hysteresis.*
3. H. Kanchwala, 2017. IIT Kanpur. Thesis: *Studies in simplified dynamic modeling and characterization of vehicle suspensions.*
4. P. Jana, 2014. IIT Kharagpur. Thesis: *Modal damping prediction for vibrating solids: Constitutive models and finite element computations.* (After I moved to IIT Kanpur, the thesis was formally jointly guided by me and Anirvan Dasgupta of Kharagpur.)
5. K. Nandakumar, 2010. IISc. Thesis: *A study of four problems in nonlinear vibrations* via *the method of multiple scales.* (I guided the thesis until submission at IISc, then left for IIT Kharagpur. Final formalities including the defense were handled by A. Ghosal of IISc.)
6. Pradeep Mahadevan, 2009. IISc. Thesis: *A prestress based approach to rotor whirl.*
7. Satwinder Jit Singh, 2008. IISc. Thesis: *New solution methods for fractional order systems.*
8. Pradipta Ranjan Basu-Mandal, 2008. IISc. Thesis: *Studies on the dynamics and stability of bicycles.*
9. Amol Marathe, 2008. IISc. Thesis: *A study of four nonlinear systems with parametric forcing.*
10. Pankaj Wahi, 2006. IISc. Thesis: *A study of delay differential equations with applications to machine tool vibrations.*
11. N. Rajanbabu, 2006. IISc. Co-advised with A. G. Menon (ISU). Thesis: *Nonlinear dynamics of resonances in, and ejection from, Paul traps.*

Prior industrial consulting work:

1. For Crompton Greaves (Nashik): modeling and simulation of a three phase circuit breaker using ADAMS (through a TCS-IISc consultancy cell called APDAP, located at IISc)
2. For KLR Industries (Hyderabad): modeling and simulation of impact and vibrations in a pneumatic hammer (through APDAP; see above)
3. For TVS Motor Co. (Hosur): discussions on motorcycle dynamics and handling
4. For BEML (Kolar Gold Fields): noise measurement from a 40-ton bulldozer (with VR Sonti of IISc)
5. For MerlinHawk Associates (Bangalore): algorithm for reduction of helicopter vibrations (with Mythily Ramaswamy and Seema Nanda of TIFR, Bangalore)
6. For CMERI (Durgapur): advice on modeling of statistics of UPV measurements for NDT in concrete (with Baidurya Bhattacharya of IIT Kharagpur)
7. For Usha Martin (Kolkata): advice on stress and deformation analysis in a cradle used for holding 40-ton reels during transport (with Vikranth Racherla of IIT Kharagpur)
8. For Usha Martin (Kolkata): advice on a testing program to quantify internal damping in steel wire ropes (with AK Mallik, formerly of IIT Kanpur)
9. For Tega Industries (Kolkata): advice on weight reduction and redesign of trommels (with Vikranth Racherla of IIT Kharagpur; my role in this project was minor).
10. For Hector Beverages (Paper Boat drinks): advice on reduction of leakages in filling and capping processes, operational aspects, and design improvements, in their plants in Manesar and Mysore, and co-packer plants in Fazilka and Hyderabad.
11. For ATI Motors (Bengaluru): advice on design, dynamics and stability of autonomous vehicles.