

Curriculum Vitae

Name: MIRA MITRA

Address:

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Current Position :

Assistant Professor, Department of Aerospace Engineering,
Indian Institute of Technology Bombay, Powai, Mumbai 400 076, INDIA
From December 2007-till date

Education:

- B. E (Civil Engineering), 2001
Jadavpur University, Calcutta, India
- M.Sc (Aerospace Engineering), 2003
Indian Institute of Science, Bangalore, India
Thesis Title: “Active Vibration Suppression of Composite Thin Walled Structures”
- PhD (Aerospace Engineering), 2007
Indian Institute of Science, Bangalore, India
Thesis Title: “Wavelet based spectral finite elements for wave propagation analysis in isotropic, composite and nano-composite structures”

Area of Interest:

Wave Propagation, Structural Health Monitoring, System Identification, Vibration Control, Wavelet and Time Frequency Analysis, Numerical Methods, Carbon Nanotubes and Nano-composites, Composite Structures

Publications:

Journals:

1. M. Mitra, S. Gopalakrishnan and M. S. Bhat A new superconvergent thin walled composite beam element for analysis of box beam structure *International Journal of Solids and Structures*, 2004, 41(5-6) pp 1491-1518
2. M. Mitra, S. Gopalakrishnan and M. S. Bhat Vibration control in a composite box beam using piezoelectric actuators *Smart Materials and Structures*, 2004. 13 (4) pp 676-690

3. M. Mitra and S. Gopalakrishnan, Spectrally formulated wavelet finite element for wave propagation and impact force identification in connected 1-D waveguides, *International Journal of Solids and Structures*, 2005, Vol. **42**, pp. 4695-4721
4. M. Mitra and S. Gopalakrishnan, Extraction of wave characteristics from wavelet-based spectral finite element formulation, *Mechanical Systems and Signal Processing*, 2006, Vol. **20**, pp. 2046-2079
5. M. Mitra and S. Gopalakrishnan, Wavelet based spectral finite element for analysis of coupled wave propagation in higher order composite beams, *Composite Structures*, 2006, Vol. **73**(3), pp. 263-277
6. M. Mitra and S. Gopalakrishnan, Wave propagation analysis in carbon nanotube embedded composite using wavelet based spectral finite element, *Smart Materials and Structures*, 2006, Vol. **15**, pp. 104-122
7. M. Mitra and S. Gopalakrishnan, Wavelet based spectral finite element modeling and detection of de-lamination in composite beams, *Proceedings of Royal Society A*, 2006, Vol. **462**(2070), pp. 1721-1740
8. M. Mitra and S. Gopalakrishnan, Wavelet based 2-D spectral finite element for wave propagation analysis isotropic plates, *CMES : Computer Modelling in Engineering and Sciences*, 2006, Vol. **15**(1), pp. 49-68
9. A. Chakraborty, B. Basu and M. Mitra, Identification of modal parameters of a mdof system by modified L-P wavelet packets, *Journal of Sound and Vibration*, 2006, Vol. **295**(3-5), pp. 827-837
10. P. S. Vignesh, M. Mitra and S. Gopalakrishnan, Nano-composite insert in 1-D waveguides for control of elastic power flow, *Nanotechnology*, 2007, Vol. **18**, pp. 035706
11. M. Mitra and S. Gopalakrishnan, Wavelet spectral element for wave propagation studies in pressure loaded axisymmetric cylinders, *Journal of Mechanics of Materials and Structures*, 2007, Vol. **2**, pp. 753-772
12. M. Mitra and S. Gopalakrishnan, Vibrational characteristics of single-walled carbon nanotubes : Time and frequency domain analysis, *Journal of Applied Physics*, 2007, Vol. **101**, pp. 114320
13. M. Mitra and S. Gopalakrishnan, Wave propagation in imperfectly bonded single-walled carbon nanotube-polymer composite, *Journal of Applied Physics*, 2007, Vol. **102**, pp. 084301
14. S. Tabrez, M. Mitra and S. Gopalakrishnan, Modeling of degraded composite beam due to moisture absorption for wave based detection., *CMES: Computer Modelling in Engineering and Sciences*, 2007, Vol. **22**, pp. 77-89
15. M. Mitra and S. Gopalakrishnan, Wave propagation analysis in anisotropic plate using wavelet spectral element approach, *Transactions of ASME: Journal of Applied Mechanics*, 2008, Vol. **75**, pp. 014504

16. M. Mitra, S. Gopalakrishnan, N. Apetre, M. Ruzzene and S. Hanagud, Perturbation technique for wave propagation analysis in a notched beam using wavelet spectral element modeling, *Journal of Mechanics of Materials and Structures*, 2008, Vol. **3**, pp. 659-673
17. M. Mitra and S. Gopalakrishnan, Wave characteristics of multi-walled carbon nanotubes, *CMES: Computer Modelling in Engineering and Sciences*, 2008, Vol. **27**, pp. 125-136
18. M. Mitra and S. Gopalakrishnan, Wave propagation in multi-walled carbon nanotube, *Computational Material Science*, 2009, Vol. **45**, pp. 411-418
19. P. A. Sonekar and M. Mitra, A wavelet based model of one-dimensional periodic structure for wave propagation analysis, *Proceedings of Royal Society A*, (In Press)

Conferences:

1. M. Mitra and B. Basu, Identification of dynamical system using non-dyadic wavelet, *Third International Conference on Identification of Engineering Systems*, University of Wales, Swansea, UK, April 2002, pp 482-491.
2. M. Mitra and S. Gopalakrishnan, A wavelet based spectral finite element for analysis of coupled wave propagation in composite beam, *Proceedings of Third MIT Conference on Computational Fluid and Solid Mechanics*, June 14-17 2005, pp. 370-376
3. M. Mitra and S. Gopalakrishnan, Modeling and estimation of delamination in a composite beam using wavelet based spectral element, *Proceedings of ISSS International Conference on Smart Materials, Structures and Systems*, Bangalore, India, July 28-30, 2005, Paper No. ISSS-2005/SB-03.
4. M. Mitra, Active wave control in 1-D waveguides using wavelet based spectral element model, *Proceedings of ISSS International Conference on Smart Materials, Structures and Systems*, Bangalore, India, July 28-30, 2005, Paper No. ISSS-2005/SD-15.
5. S. Gopalakrishnan and M. Mitra, Various modeling and damage detection schemes for SHM of composite structures, *International Conference on Computational and Experimental Engineering and Sciences*, Chennai, India, December, 2006.
6. M. Mitra and S. Gopalakrishnan, A wavelet based 2-D spectral finite element for wave propagation analysis in laminated composite structures, 47th *AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Material Conference* Newport, Rhode Island, May, 2006, Paper No. AIAA 2006-2283.
7. M. Mitra and S. Gopalakrishnan, Axisymmetric wave propagation in single-walled carbon nanotubes, 48th *AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Material Conference* Honolulu, Hawaii, April, 2007, Paper No. AIAA 2007-2220.

8. P. S. Vignesh, M. Mitra and S. Gopalakrishnan, Control of elastic power flow in 1-D waveguides using nano-composite inserts, 48th *AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Material Conference* Honolulu, Hawaii, April, 2007, Paper No. AIAA 2007-2219.
9. M. Mitra and S. Gopalakrishnan, Wave propagation in multi-walled carbon nanotubes, International Conference on Multiscale Modeling and Simulation, Bangalore, India, January 2008
10. M. Mitra and S. Gopalakrishnan, Wave characteristics of multi-walled carbon nanotubes, 49th *AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Material Conference*, Schaumburg, IL, April, 2008, Paper No. AIAA-2008-1782
11. M. Mitra and S. Gopalakrishnan, Wave propagation in single-walled carbon nanotube-polymer composite with imperfect bonding, 49th *AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Material Conference*, Schaumburg, IL, April, 2008, Paper No. AIAA-2008-1780
12. A. Sharan and M. Mitra, Wave based damage prediction through force reconstruction, 50th *AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Material Conference*, Palm Springs, California, May, 2009, Paper No. AIAA-2009-2554
13. S. Gopalakrishnan and M. Mitra, Structural Dynamics Research in India, 50th *AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Material Conference*, Palm Springs, California, May, 2009, Paper No. AIAA-2009-2440

Recognitions:

- **Young Researcher Fellowship award 2005**, awarded by Third MIT Conference on Computational Solid and Fluid Mechanics, 2005.
- Research profiled by leading technology magazine **Frost and Sullivan**
- **K. Suryanarain Rau Memorial Senior Student Award for Research and Development in Smart Technology, 2005**

Courses Taught:

1. Advance Topics in Aerospace Structures: (Elastic wave propagation in structures 8 Lectures) January-April, 2008, 2009

2. Vibration and Structural Dynamics, July-November, 2008, 2009