

Curriculum Vitae

Present Occupation

<i>Organization</i>	Indian Institute of Technology, Madras
<i>Department</i>	Mechanical Engineering
<i>Section</i>	Machine Design Section
<i>Designation</i>	Assistant Professor

Research Interests: Vibration, Acoustics, Wave propagation, Asymptotic Methods, Computational Methods.

General Interests: Mathematics, Mechanics, Signals and Systems.

Previous Work Experience

<i>Organization</i>	Eaton Technologies Pvt. Ltd., Pune, India
<i>Division</i>	Modeling & Simulation- Centre of Excellence
<i>Tenure</i>	March, 2009 – March, 2010
<i>Job Description</i>	Modeling and Simulation for sound prediction in axial piston pumps, Translating the test/operating conditions of the product into modeling parameters for analysis, Collaborating with the test teams to achieve acceptable correlation between analysis and experimental results.

<i>Organization</i>	Tata Motors Pvt. Ltd., Pune, India
<i>Division</i>	Engineering Research Centre- NVH & CAD Lab
<i>Tenure</i>	December 2002 - December 2003
<i>Job Description</i>	FE/BE modeling and analysis for structure-borne noise, Modal analysis through Finite Element and Experimentation, Correlation of Finite Element and Experimental models, Silencer Design and Evaluation.

Education

Degree	University	Institution	Year
B.E. (Mechanical)	North Bengal University	Govt. Engg. College, Jalpaiguri	2000
M.Sc (Engg.)	Indian Institute of Science, Bangalore	<i>Project Title: Application of structural acoustic response in imaging material inclusions</i>	2002
Ph.D	Indian Institute of Science, Bangalore	<i>Project title: Asymptotic analysis of the dispersion characteristics of structural acoustic waveguides</i>	2009

Courses Taught

Course number / Course Title	Level	Semester & Year	Number of Students	Collaborator(s) (if any)
ME1120 (Engineering Drawing)	B. Tech core	Aug-Dec, 2010	85	
		Jan-April, 2011	90	
		Aug-Dec, 2011	85	
ME7840 (Signal Processing of Mechanical Systems)	M. Tech Elective	Aug-Dec, 2010	20	Prof. C. Sujatha
ME7360 (Theory of Vibration)	M. Tech core	Aug-Dec, 2010	50	Prof. S. Swarnamani
ME 7910 (Acoustics and Noise Control)	M.Tech Elective	Jan-April, 2011	7	
		Jan-April, 2012	23	
ME6820 (Fundamentals of Engineering Design)	M.Tech Core	Aug-Dec, 2012		
ME 6003 (Variational Principles in Mechanics)	M.Tech Elective	Aug-Dec, 2011	6	Dr. P. Ravindran
		Aug-Dec, 2012		

New Course Developed

Course Number	Course Title	Level	Semester & Year	Collaborator(s)
ME6003	Variational Principles in Mechanics	M.Tech Elective	Aug-Dec 2011	Dr. P. Ravindran

Student Guidance (Completed)

No.	Name	Programme	Title of the work	Duration	Collaborator(s)
1	Tejas Pant	Summer Internship	Fluid Flow and Thermomechanical Analyses of an optical engine cylinder	May-July, 2011	Prof. P.S. Mehta
2	Tanuja Khambham	B.Tech	Model to study deformation characteristics of DNA	August 2010 – May 2011	Prof. S. K. Das
3	Uday Shankar Roy	M.Tech	Efficient Transient structural dynamics using wavelet finite element Method	May 2011 – Till date	
4	M. Solairaju	M.Tech	Vibro-acoustics of bearing	May 2011 – May 2012	Prof. A. S. Sekhar
5	T. S. Indraneel	Dual Degree	Acoustic energy harvesting	May 2011 – Till date	Prof. S. Narayanan

Student Guidance (Ongoing)

No.	Name	Programme	Research Area	Duration	Collaborator(s)
1	Manish Dhanwani	M.S.	Energy Harvesting through vortex induced vibration	August 2010 – Till date	Dr. B. S. V. Patnaik
2	Gyani Shankar Sharma	M. S	Vibro-acoustics	August 2011 – Till date	Prof. N. Ganesan
3	V. Archana	M. Tech	Vibro-acoustics	Feb 2012-Till date	

Invited talks

1. A. Sarkar, “Quiet Product Design – challenges ahead”, in *Future trends in Acoustics and Vibration DST workshop held at IIT Madras, organized by Department of Mechanical Engineering, IIT Madras 23rd-24th September, 2010.*
2. A. Sarkar, “From Fluid Mechanics to Acoustics”, in *AICTE short term training program on Introduction to Turbulent flows and their prediction Modeling held at IIT Madras, organized by Department of Applied Mechanics IIT Madras, 19th – 23rd March, 2011.*
3. A. Sarkar, “Flow-structure-acoustic interaction”, in *AICTE short term training program on Introduction to Turbulent flows and their prediction Modeling held at IIT Madras, organized by Department of Applied Mechanics & Department of Mechanical Engineering, IIT Madras, 10th – 15th March, 2012.*

Sponsored projects

1. *Title:* Blast mitigation through fluid structure interaction
Sponsoring Agency: DMRL, Hyderabad
Principal Investigator: Prof. C. Lakshman Rao, Dept of Applied Mechanics, IIT Madras
Co-Investigators: Prof. B. S. V. Patnaik, Dept of Applied Mechanics, IIT Madras
Dr. Abhijit Sarkar, Dept of Mechanical Engg., IIT Madras
Project Duration: 2 years (April 2011 – April 2013).
Budget: Rs 21.00 Lakhs
2. *Title:* Vibration & Stress Analysis of LP Stage Moving Blade for 195 MW Thermal power plant.
Sponsoring Agency: BHEL, Bhopal
Principal Investigator: Prof. A. S. Sekhar, Dept of Mechanical Engineering, IIT Madras
Co-Investigators: Dr. Abhijit Sarkar, Dept of Mechanical Engg., IIT Madras
Project Duration: 1.5 years
Budget: Rs 8.00 Lakhs

Continuing Education Program

1. Lectured for 18 hours on “*Mechanics of Materials*” under the Continuing Education Program for M/S Caterpillar Pvt. Ltd - 2011. The lectures were attended by 25 engineers from M/S Caterpillar Pvt. Ltd. The program was coordinated by Prof. N. Siva Prasad, Mechanical Engineering, IIT Madras.
2. Conducted a 7 day training program (jointly with Prof. P. Chandramouli) on “*Noise & Vibration*” under the Continuing Education Program for M/S Tafe Pvt. Ltd. – 2012. The lectures were attended by 20 engineers from M/S Tafe Pvt. Ltd.

Complete List of Publications

International Journals

1. A. Sarkar, V. R. Sonti and R. Pratap, “A coupled FEM-BEM formulation for imaging material inclusions”, *International Journal of Acoustics and Vibration*, Vol. 10(1), pp. 3-16, 2005.
2. A. Sarkar and V. R. Sonti, “An asymptotic analysis for the coupled dispersion characteristics of a structural acoustic waveguide”, *Journal of Sound and Vibration*, Vol. 306, pp. 657-674, 2007.
3. A. Sarkar and V. R. Sonti, “Asymptotic analysis for the coupled wavenumbers in an infinite fluid-filled flexible cylindrical shell: the axisymmetric mode”, *Computer Modeling in Engineering and Sciences*, Vol. 21(3), pp. 193-207, 2007.
4. A. Sarkar and V. R. Sonti, “Asymptotic analysis for the coupled wavenumbers in an infinite fluid-filled flexible cylindrical shell: the beam mode”, *Journal of Sound and Vibration*, Vol. 319, pp. 646-667, 2009.
5. A. Sarkar and V. R. Sonti, “Simplified dispersion curves for circular cylindrical shell using shallow shell theory”, *Journal of Sound and Vibration*, Vol. 322, pp. 1-7, 2009.
6. A. Sarkar and V. R. Sonti, “Wave equations and solutions of in vacuo and fluid-filled elliptic cylindrical shell”, *International Journal of Acoustics and Vibration*, Vol. 14(1), pp. 35-45, 2009.
7. M. V. Kunte, A. Sarkar and V. R. Sonti, “Generalized asymptotic expressions for coupled wavenumbers in fluid-filled cylindrical shells”, *Journal of Sound and Vibration*, Vol 329(25), pp. -5356-5374, 2010.
8. M.V. Kunte, A. Sarkar and V. R. Sonti, “Generalized asymptotic expansions for the wavenumbers in infinite flexible in vacuo orthotropic cylindrical shells”, *Journal of Sound and Vibration*, Vol 330, pp. 5628-5643, 2011.
9. A. Sarkar, M. V. Kunte and V. R. Sonti, “Unified dispersion characteristics of structural acoustic waveguides”, *Computer Modeling in Engineering and Sciences*, Vol 81 (3), pp 249-267, 2012.
10. M. V. Kunte, A. Sarkar and V. R. Sonti, “Asymptotic expansions for the coupled wavenumbers in an infinite orthotropic flexible fluid-filled cylindrical shell”, accepted for publication in *Journal of the Acoustical Society of America*, 2012.

International Conferences

1. A. Sarkar, V. R. Sonti and R. Pratap, “Imaging material inclusions in structural acoustics using a coupled FEM/BEM formulation”, *Internoise 2004*, Prague, Czech Republic, 22nd-25th August, 2004.
2. A. Sarkar and V. R. Sonti, “An asymptotic analysis for the coupled dispersion characteristics of a fluid-filled cylindrical shell”, paper no. 278, *International Congress of Sound and Vibration 14*, Cairns, Australia, 9th – 12th July, 2007.
3. A. Sarkar and V. R. Sonti, “An asymptotic analysis for the coupled dispersion characteristics of a structural acoustic waveguide”, paper no. 363, *Internoise 2007*, Istanbul, Turkey, 28th-31st August, 2007.
4. A. Sarkar and V. R. Sonti, “Numerical solutions to the coupled wavenumbers in an infinite fluid-filled elliptic cylindrical shell”, paper no. 134, *International Conference on Theoretical, Applied, Computational and Experimental Mechanics*, IIT Kharagpur, India, 27th-29th December, 2007.
5. A. Sarkar and V. R. Sonti, “Coupled wavenumbers of structural acoustic waveguides: an unified asymptotic approach”, paper no. 483, *Acoustics’08*, Paris, France, 29th June-4th July, 2008. This conference merges in itself the 155th meeting of The Acoustical Society of America, 5th Forum Acustum and 9th Congress Francaise d’Acoustique.
6. A. Sarkar and V. R. Sonti, “Asymptotic analysis for the coupled wavenumbers in an infinite fluid-filled flexible cylindrical shell: the beam mode”, *International Congress of Sound and Vibration 15*, Daejeon, Korea, 6th-10th July 2008.
7. M. V. Kunte, V. R. Sonti and A. Sarkar, “Generalized expressions for the wavenumbers in an infinite flexible orthotropic cylindrical shell”, *International Congress of Sound and Vibration 17*, Cairo, Egypt, 18th-22nd July 2010.
8. T. R. Milind, S. Sonawane, A. Sarkar, M. Beyer, Hongbin Wang, “Noise prediction in axial piston pumps”, 37th National and 4th International conference on Fluid Mechanics and Fluid Power 2010, IIT Madras, Chennai, 2010.

National Conferences

1. A. Sarkar and V. R. Sonti, “Propagation constants of fluid-loaded periodic beam using FEM”, paper no. TA-17, *National Symposium of Acoustics* held at NAL, Bangalore, 15th-16th December 2005. **Received the best student paper award.**
2. A. Sarkar and V. R. Sonti, “An asymptotic approach for the coupled dispersion characteristics of a fluid-filled infinite cylindrical shell”, *National Conference of Research Scholars in Mechanical Engineering* held at IIT Kanpur, 23rd-24th March, 2007.
3. A. Sarkar and V. R. Sonti, “Coupled wavenumbers of an infinite plate loaded with a finite fluid column: an asymptotic approach”, paper no. AI-09, *National Symposium of Acoustics* held at KSRCT Tiruchengode, 5th-7th December, 2007. **Received the best student paper award.**
4. A. Sarkar and V. R. Sonti, “Coupled wavenumbers of a two-dimensional structural acoustic waveguide with bulk flow”, *National Symposium of Acoustics* held at Govt. Post Graduate College, Rishikesh, 11th-13th November, 2010.
5. G. T. K. Manohar, Uday Shankar Roy and Abhijit Sarkar, “Vibration Analysis of Bent Pipes using FEM”, *National Symposium of Acoustics* organized by the Acoustical Society of India and held at Bundelkhand University, Jhansi, November, 2011.
6. Manish Dhanwani, Abhijit Sarkar and B. S. V. Patnaik, “Optimal Design of an energy harvester for vortex induced vibration”, 38th *National conference on Fluid Mechanics and Fluid Power 2011*, MANIT Bhopal, December, 2011.