

C S Manohar

Curriculum Vitae

2017

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1.0 Education

- BE (Civil Engg.), 1982, Karnatak University, India, First Class with Distinction.
- ME (Civil Engg.), 1984, Indian Institute of Science, First Class with Distinction.
- PhD (Faculty of Engineering), 1989, Indian Institute of Science, Bangalore.

2.0 Work Experience

2.1 Academic positions held at the Indian Institute of Science

- Professor, May 2005-present, Department of Civil Engineering.
- Associate Professor, May 1999-May 2005, Department of Civil Engineering.
- Assistant Professor, May 1993-May 1999, Department of Civil Engineering.

2.2 Other positions held at the Indian Institute of Science

- Chairman, December 2010- 2013, Department of Civil Engineering.
- Chairman, July 2007- December 2010, Centre for Earth Sciences.
- Associate Faculty Member, 2007-present, Centre for Earth Sciences.

2.3 Positions held outside the Indian Institute of Science

- Visiting Professor, October 2011, Dept. of Civil and Env. Engg, Carleton Univ, Ottawa, Canada.
- Visiting Scientist, May 2003, Dept. of Civil Engineering, University of Delaware, USA.
- Visiting Assoc. Professor, June-July, 2003, Dept. of Civil Engg, The Johns Hopkins Univ., USA.
- Research Assistant, May 1991-May 1993, Dept. of Engineering Sciences, Univ. of Oxford, UK.
- Scientist, Oct 1990-May 1991, Structural Engineering Research Centre, Chennai, India

3.0 Recognitions/Honors

- Associate Editor, Journal of Structural Engineering, American Society of Civil Engineers (since 2013).
- Member, Editorial Board, Structural Safety (Elsevier) (since 2012)
- Member, Editorial Board, Probabilistic Engineering Mechanics (Elsevier) (since 2009)
- Member, Editorial Board, Structural Control and Health Monitoring (Wiley) (since 2009)
- Member, Editorial Board, Earthquakes and Structures (Techno Press) (from 2010).
- Associate Editor, ISET Journal of Earthquake Technology, (2007-2010); Member Advisory Board of the Journal since 2010.
- Member, Technical Committee on Dynamics, Engineering Mechanics Division, American Society of Civil Engineers, 2003-2010.
- Sir C V Raman award for young scientists (1999, Government of Karnataka, India).
- Session Organizer and Chair, Indo-American Frontiers of Engineering Symposium, Washington, 1-3 March 2012, Organized by the US National Academy of Engineering and Indo-US S&T Forum, (Title of the session: Engineering Large Infrastructure for Disaster/ Hazards).
- Session Organizer and Chair, Indo-German Frontiers in Engineering Symposium, March 14-17, 2013, Organized by the Von Humbolt Foundation, Germany and Department of Science and Technology, India, (Title of the session: Engineering for natural disasters and risk management).

- Professor G S Ramaswamy Memorial Lecture June 2016, CSIR SERC Foundation Day Lecture, Madras (title: Safety of engineering structures: prediction, diagnosis, and prognosis).

4.0 Research interests

- Structural dynamics: modeling of nonlinearity and uncertainties; computational and experimental methods; inverse problems: structural system identification and damage detection using measured vibration data; statistical energy analysis.
- Stochastic structural mechanics: stochastic FEM; random vibrations; Bayesian filtering; Monte Carlo simulations & variance reduction schemes; structural reliability modeling.
- Earthquake engineering: seismic safety of large scale structures; science of earthquake simulations: hybrid test methods; real time substructuring; fire following earthquakes.

5.0 List of publications

5.1 Journal papers: under review

1. Oindrila Kanjilal and C S Manohar, 2017, State dependent Girsanov's controls in time variant reliability estimation in randomly excited dynamical systems, Under review, Structural Safety.
2. Oindrila Kanjilal and C S Manohar, 2017, Estimation of time variant system reliability of nonlinear randomly excited systems based on the Girsanov transformation with state dependent controls, under review, Nonlinear Dynamics.
3. S Abhinav and C S Manohar, 2017, Combined state and parameter identification of nonlinear structural dynamical systems based on Rao-Blackwellization and Markov chain Monte Carlo simulations, under review, Mechanical Systems and Signal Processing.
4. G Greegar, S Abhinav, and C S Manohar, 2017, Model distance based global response sensitivity indices for randomly inhomogeneous structures under stochastic excitations, under review, ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A.
5. Nithin Raj and C S Manohar, 2017, Application of independent component analysis in modelling of non-Gaussian data in structural reliability estimation, under review, ASCE Journal of Engineering Mechanics.
6. Sonal Dhanvijay and CS Manohar and C S Manohar, 2017, Experimental estimation of time variant structural reliability via intelligent sampling, under review. Journal of structural engineering.
7. Sonal Dhanvijay, S Ammanagi, and CS Manohar, 2017, Experimental estimation of time variant system reliability of vibrating structures based on subset simulations with Markov chain splitting, under review, Reliability Engineering and Systems Safety.

5.2 Journal papers: published/accepted

1. K Karuna, and C S Manohar, Inverse problems in structural safety analysis with combined probabilistic and non-probabilistic uncertainty models, Accepted for publication, Engineering Structures, 2017.
2. Abhinav, S., and C. S. Manohar. "Substructuring tools for probabilistic analysis of instrumented nonlinear moving oscillator-beam systems." Applied Mathematical Modelling 42 (2017): 600-617.

3. Kanjilal, Oindrila, and C. S. Manohar. "Girsanov's transformation based variance reduced Monte Carlo simulation schemes for reliability estimation in nonlinear stochastic dynamics." *Journal of Computational Physics* 341 (2017): 278-294.
4. Ammanagi, S., and C. S. Manohar. "Adaptive time stepping in pseudo-dynamic testing of earthquake driven structures." *Bulletin of Earthquake Engineering* 14.11 (2016): 3047-3074.
5. G Greegar and C S Manohar, 2016, Global response sensitivity analysis of uncertain structures, *Structural Safety*, 58, 94-104.
6. S Abhinav and C S Manohar, 2016, Global response sensitivity analysis of randomly excited dynamic structures, *ASCE Journal of Engineering Mechanics*, 142 (3) 04015094.
7. S Ammanagi and C S Manohar, 2015, Optimal input cross-power spectra in shake table testing of asymmetric structures, *Earthquake and Structures*, 9 (5), 1115-1132
8. G Greegar and C S Manohar, 2015, Global response sensitivity analysis using probability distance measures and generalization of Sobol's analysis, *Probabilistic Engineering Mechanics*, 41, 21-33.
9. V S Sundar, S Ammanagi, and C S Manohar, 2015, System reliability of randomly vibrating structures: computational modeling and laboratory testing, *Journal of Sound and Vibration*. 351(1), 189-205.
10. Rajdip Nayek and C S Manohar, 2015, Girsanov transformation based reliability modeling and testing of actively controlled structures, *Journal of Engineering Mechanics*, ASCE, 141(6), 04014168.
11. Kanjilal and C S Manohar, 2015, Markov Chain splitting methods in structural reliability estimation, *Probabilistic Engineering Mechanics*, 40, 42-51.
12. S Abhinav and C S Manohar 2015, Bayesian parameter identification in dynamic state space models using modified measurement equations, *International Journal of Nonlinear Mechanics*, 71, 89-103
13. Ammanagi and C S Manohar 2015, Optimal cross-spectrum of road loads on vehicles: theory and experiments, *Journal of Vibration and Control*, 10.1177/1077546315570107.
14. V S Sundar and C S Manohar 2015, Experimental studies on reliability model updating of a building frame model under random earthquake loads, Accepted, *International Journal of Life Cycle Reliability and Safety Engineering*.
15. V S Sundar, and C S Manohar, 2014, Random vibration testing with controlled samples, Accepted for publication, *Structural Control and Health Monitoring*. DOI: 10.1002/stc.1646
16. V S Sundar, and C S Manohar, 2014, Estimation of time variant reliability of randomly parametered nonlinear vibrating systems, *Structural Safety*, 47, 59-66.
17. V S Sundar and C S Manohar, 2014, Updating reliability models for existing structures using measured responses, Accepted for publication, *International Journal of Life Cycle Reliability and Safety Engineering*.
18. B Radhika and C S Manohar, 2013, Dynamic state estimation for identifying earthquake support motions in instrumented structures, *Earthquake and Structures*, 5(3).
19. V S Sundar and C S Manohar, 2013, Estimation of time variant reliability of randomly parametered non-linear vibrating systems, *Structural Safety*, 40, 21-30.
20. V S Sundar and C S Manohar, 2013, Time variant reliability model updating in instrumented dynamical systems based on Girsanov transformation, *International Journal of Nonlinear Mechanics*, 52, 32-40.
21. V S Sundar and C S Manohar, 2013, Updating reliability models of statically loaded structures, *Structural Safety*, 40, 21-30.
22. J M Chandra Kishen, Ananth Ramaswamy, and C S Manohar, 2013, Safety assessment of a brick masonry arch bridge: field testing and simulations, *ASCE Journal of Bridge Engineering*, 18(2), 162-171.

23. B Radhika and C S Manohar, 2012, Nonlinear dynamic state estimation in instrumented structures with conditionally linear Gaussian substructures, *Probabilistic Engineering Mechanics*, 30, Pages 89-103.
24. C S Manohar, 2011, Updating response sensitivity models of nonlinear vibrating structures using particle filters, *Computers and Structures*, 89 (11-12), 901-911.
25. H A Nasrellah and C S Manohar, 2011, Finite element method based Monte Carlo filters for structural system identification, *Probabilistic Engineering Mechanics*, 26, 294–307.
26. H A Nasrellah and C S Manohar, 2011, Particle filters for structural system identification using multiple test and sensor data: a combined computational and experimental study, *Structural Control and Health Monitoring*, 18, 99–120.
27. B Radhika and C S Manohar, 2010, Reliability models for existing structures based on dynamic state estimation and data based asymptotic extreme value analysis, *Probabilistic Engineering Mechanics*, 25, 393-405.
28. H A Nasrellah and C S Manohar, 2010, A particle filtering approach for structural system identification in vehicle-structure interaction problems, *Journal of Sound and Vibration*, 329(9), 1289-1309.
29. R Sajeeb, C S Manohar and D Roy, 2010, A semi-analytical particle filter for identification of nonlinear oscillators, *Probabilistic Engineering Mechanics*, 25, 35-48
30. R Sivaprasad, S Venkatesha, and C S Manohar, 2009, Identification of dynamical systems with fractional derivative damping models using inverse sensitivity analysis, *Computers, Materials and Continua*, 9 (3), 179-207.
31. R Tipireddy, H A Nasrellah and C S Manohar, 2009, A Kalman filter based strategy for linear structural system identification based on multiple static and dynamic test data, *Probabilistic Engineering Mechanics*, 24, 60-74.
32. R Sajeeb, C S Manohar and D Roy, 2009, A Conditionally linearized Monte Carlo filter in nonlinear structural dynamics, *International Journal of Nonlinear Mechanics*, 44(7), 776-790
33. R Sajeeb, C S Manohar and D Roy, 2009, Rao-Blackwellization with substructuring for state and parameter estimations of a class of nonlinear dynamical systems, *International Journal of Engineering Under Uncertainty: Hazards, Assessment and Mitigation*, 1(1-2) 2009.
34. S Venkatesha, R Rajender, and C S Manohar, 2008, Inverse sensitivity analysis of singular solutions of FRF matrix in structural system identification, *CMES: Computer Modeling in Engineering and Science*, 37(2), 113-152.
35. V Namdeo and C S Manohar, 2008, Force state maps using reproducing kernel particle method and kriging based functional representations, *CMES: Computer Modeling in Engineering and Science*, 32(3), 123-160.
36. S S Panda and C S Manohar, 2008, Applications of meta-models in finite element based reliability analysis, *CMES: Computer Modeling in Engineering and Sciences*, 28, NO. 3, 161-184.
37. B Radhika, S S Panda and C S Manohar, 2008, Time variant reliability analysis using data based extreme value analysis, *CMES: Computer Modeling in Engineering and Sciences*, 27(1-2),79-110.
38. S Ghosh, C S Manohar and D Roy, 2008, Sequential importance sampling filters with a new proposal distribution for parameter identification of structural systems, *Proceedings of Royal Society of London, A*, 464, 25-47.
39. V Namdeo and C S Manohar, 2007, Nonlinear structural dynamical system identification using adaptive particle filters, *Journal of Sound and Vibration*, 306, 524-563.
40. R Sajeeb, C S Manohar and D Roy, 2007, Control of Nonlinear Structural Dynamical Systems with Noise Using Particle Filters, *Journal of Sound and Vibration*, 306, 25, 111-135.
41. S Ghosh, D Roy and C S Manohar, 2007, New forms of extended Kalman filter via transversal linearization and applications to structural system identification, *Computer Methods in Applied Mechanics and Engineering*, 196, 5063-5083.

42. M Manjuprasad and C S Manohar, 2007, Adaptive random field mesh refinements in stochastic finite element reliability analysis of structures, *CMES: Computer Modeling in Engineering and Sciences*, 19(1), 23-54.
43. R Sajeeb, D Roy and C S Manohar, 2007, Numerical aspects of a real-time substructuring technique in structural dynamics, *International Journal of Numerical Methods in Engineering*, 72, 1261-1313.
44. A M Abbas and C S Manohar, 2007, Critical vector random earthquake loads for parametrically excited structures, *Structural Safety*, 29(1), 32-48.
45. Sayan Gupta and C S Manohar, 2006, Reliability analysis of randomly parametered linear vibrating systems subjected to stochastic excitations, *Journal of Sound and Vibration*, 297(3-5), 1000-1024.
46. C S Manohar and D Roy, 2006, Nonlinear structure system identification using Monte Carlo filters, *Sadhana, Academy Proceedings in Engineering, Indian Academy of Science*, 31(4), 399-427.
47. Sayan Gupta and C S Manohar, 2005, Extreme value distribution of von Mises stress in randomly vibrating structures, *Journal of Vibration and Acoustics, Transaction of ASME*, 127 (6), 547-555.
48. Sayan Gupta and C S Manohar, 2005, Development of multivariate extreme value distributions for random vibration applications, *Journal of Engineering Mechanics, ASCE*. 131(7), 712-720.
49. A M Abbas and C S Manohar, 2005, Reliability based critical excitation models. Part I: Linear structures, *Journal of Sound and Vibration*, 287, 865-882.
50. A M Abbas and C S Manohar, 2005, Reliability based critical excitation models. Part II: Nonlinear structures, *Journal of Sound and Vibration*, 287, 883-900.
51. C S Manohar and R Ghanem, 2005, Multivariate probability distribution of ordered peaks of vector Gaussian random processes, *Probabilistic Engineering Mechanics*, 20, pp 87-96.
52. Saikat Saha and C S Manohar, 2005, Inverse reliability design of structures subjected to partially specified earthquake loads, *Probabilistic Engineering Mechanics*, 20, 19-31.
53. Sayan Gupta and C S Manohar, 2004, Response surface method for time variant reliability analysis of nonlinear random structures under nonstationary excitations, 36, 267-280, *Nonlinear Dynamics*.
54. Sayan Gupta and C S Manohar, 2004, Improved response surface method for structural reliability analysis, 123-139, *Structural safety*.
55. S Ammanagai, S Venkatesha, and C S Manohar, 2004, Analytical and experimental investigations of structural damages in beams and built-up structures using vibration data, 31(1), 73-84, *Journal of Structural Engineering, Structural Engineering Research Centre, Madras*.
56. Luna Majumder and C S Manohar, 2003, A time domain approach for damage detection in bridge structures using vibration data with moving vehicle as an excitation source, 268, 699-716, *Journal of sound and Vibration*.
57. C S Manohar, S Venkatesha and S Sadasivan, 2003, Finite element analysis of vehicle-structure interactions during launching of remotely piloted air-vehicles, 30(1), 1-6, *Journal of Structural Engineering, Structural Engineering Research Centre, Madras*.
58. C S Manohar, R Ravi and Ch Srinivas, 2003, Nonlinear structures under random differential support motions and determination of critical input models, 2(3), 171-198, *Advances in vibration engineering, Vibration Institute of India*.
59. Luna Majumder and C S Manohar, 2002, Nonlinear reduced models for beam damage detection using data on moving oscillator-beam interactions, 82, 301-314, *Computers and Structures*.

60. Sayan Gupta and C S Manohar, 2002, Dynamic stiffness method for circular stochastic Timoshenko beams: response variability and reliability analyses, *Journal of Sound and Vibrations*, 253(5), 1051-085.
61. Abbas M and C S Manohar, 2002, Investigations into critical excitation models within deterministic and probabilistic frameworks: single point excitations, *Earthquake Engineering and Structural Dynamics* 31, 813-832.
62. A M Abbas and C S Manohar, 2002, Critical spatially varying earthquake load models, *Journal of Structural Engineering*, Structural Engineering Research Centre, Madras, 29, 39-52.
63. Sondipon Adhikari and C S Manohar, 2000, Transient dynamics of stochastically parametered beams, *ASCE Journal of Engineering Mechanics* 126(11), 1131-1140.
64. C S Manohar and R A Ibrahim, 1999, Progress in structural dynamics with stochastic parameter variations 1987-1998, *ASME Applied Mechanics Reviews*, 52(5), 177-197.
65. Sondipon Adhikari and C S Manohar, 1999, Dynamical analysis of framed structures with statistical uncertainties, *International Journal of Numerical Methods in Engineering*, 44, 1157-1178.
66. C S Manohar and Sondipon Adhikari, 1998, Statistics of vibration energy flow in trusses, *Journal of Sound and Vibration*, 217(1), 43-74.
67. Abhijit Sarkar and C S Manohar, 1998, Multi-support stochastic seismic critical excitations for extended structures, *Journal of Sound and Vibration*, 212(3), 525-546.
68. C S Manohar and Sondipon Adhikari, 1998, Dynamic stiffness matrix of randomly parametered beams, *Probabilistic Engineering Mechanics* 13, 39-52.
69. C S Manohar, 1997, Dynamic stiffness matrix for axially vibrating stochastic rods using Stratonovich's averaging principle, *Archive of Applied Mechanics*, 67, 200-213.
70. Abhijit Sarkar and C S Manohar, 1996, Critical cross-spectral density functions and the highest response of multi-supported structures subjected to multi-component earthquake excitations, *Earthquake engineering and structural dynamics*, 25, 303-315.
71. Abhijit Sarkar and C S Manohar, 1996, Dynamic stiffness matrix of a general cable element, *Archive of Applied Mechanics*, 66, 315-325.
72. C S Manohar, 1995, Methods of nonlinear random vibration analysis, *Sadhana, Academy Proceedings in Engineering*, Indian Academy of Science, 20, 345-371.
73. C S Manohar and Abhijit Sarkar, 1995, Critical earthquake input power spectral density function models for engineering structures, *Earthquake engineering and structural dynamics*, 24(12), 1549-1566.
74. C S Manohar and R N Iyengar, 1994, Free Vibration analysis of stochastic strings, *Journal of Sound and Vibration*, 176(1), 35-48.
75. C S Manohar and A J Keane, 1994, Statistics of energy flows in one-dimensional subsystems, *Philosophical Transactions of Royal Society of London, A*, 346, 525-542.
76. R N Iyengar, C S Manohar and O R Jaiswal, 1994, Field Investigation of the 30th September Maharashtra earthquake, *Current Science*, Indian Academy of Science, 67(5), 368-379.
77. C S Manohar and A J Keane, 1993, Axial vibrations of a stochastic rod, *Journal of Sound and Vibration*, 165(3), 341-359.
78. A J Keane and C S Manohar, 1993, Power flow variability in a pair of coupled stochastic rods, *Journal of Sound and Vibration*, 168(2), 253-284.
79. C S Manohar and R N Iyengar, 1993, Probability distribution of the eigenvalues of systems governed by the stochastic wave equation, *Probabilistic Engineering Mechanics*, 8(1), 57-64.
80. C S Manohar and R N Iyengar, 1991, Entrainment of Van der Pol's oscillator in presence of combined periodic excitation and noise, *International Journal of Nonlinear Mechanics*, 26(5), 679-786.
81. C S Manohar and R N Iyengar, 1991, Narrow band random excitation of a limit cycle system, *Archives of Applied Mechanics*, 61, 133-141.

82. R N Iyengar and C S Manohar, 1991, Rocking response of rectangular rigid blocks under random noise base excitations, *International Journal of Nonlinear Mechanics*, 26(6), 885-892.
83. R N Iyengar and C S Manohar, 1989, Probability distribution of the eigenvalues of the random string equation, *Transaction of ASME, Journal of Applied Mechanics*, 56, 202-207.
84. R N Iyengar, K R Reddy and C S Manohar, 1989, Chaotic response of some simple nonlinear oscillators, *Journal of Aeronautical Society of India*, 41(1), 1-6.
85. R N Iyengar and C S Manohar, 1987, Nonstationary random critical seismic excitations, *ASCE Journal of Engineering Mechanics*, 113(4), 529-541.

5.3 Chapter in books

1. H A Nasrellah, B Radhika, V S Sundar, and C S Manohar, 2013, Simulation based methods for model updating in structural condition assessment, in *Health Assessment of Engineered Structures: Bridges, Buildings and Other Infrastructures*, Edited by A Haldar, World Scientific, Singapore (Accepted for publication).
2. C S Manohar and Sayan Gupta, 2005, Modeling and evaluation of structural reliability: current status and future directions, in *Recent Advances in Structural Engineering*, Edited by K S Jagadish and R N Iyengar, University Press, Hyderabad, pp. 90-187.
3. C S Manohar and A J Keane, 1997, Statistics of energy flows in one dimensional subsystems, in *Statistical Energy Analysis: An overview with applications in structural dynamics*, Edited by A J Keane and W G Price, Cambridge University Press, pp. 95-112.
4. S Abhinav, Debraj Ghosh, and C S Manohar, 2014, Substructuring methods in finite element analysis, *Encyclopedia of Earthquake Engineering*, Springer, Editors: M. Beer, I. Kougoumtzoglou, E. Patelli, I, Siu-Kui Au.
5. V S Sudnar and C S Manohar, 2014, Reliability estimation and analysis for dynamical systems, *Encyclopedia of Earthquake Engineering*, Editors: M. Beer, I. Kougoumtzoglou, E. Patelli, I, Siu-Kui Au.

5.4 Review of Books

1. C S Manohar, 2015, Review of “Applied structural and mechanical vibrations – theory and methods, 2nd Edition, xxiii+644 pp. 2014, by P L Gatti, Boca Raton: CRC Press.” *Journal of Sound Vibration* 336 (2015): 293-295.
2. C S Manohar, 2009, Review of “Critical Excitation Methods in Earthquake Engineering, Izuru Takewaki. Elsevier, Amsterdam (2007). 270 pp., Hardbound, \$146.00, ISBN-13: 978-0-08-045309-5”, *Engineering Structures*, 31(8), 1916-1917.
3. C S Manohar, 2003, Review of the book “Scattering of waves: applications to the Mexico City Valley, by E Reinoso, WIT Press, Southampton, UK. 2002. 202 pp. ISBN 1-85312-833-3. \$122.00” *Applied Mechanics Review*, 56, B48.
4. C S Manohar, 2001, Review of the book “Dynamic Analysis and Earthquake Resistant Design, Volume 2: Methods of Dynamic Analysis”, *Applied Mechanics Reviews*, 54, B75.

5.5 Papers in conferences, symposia and workshops

1. Oindrila Kanjilal and C S Manohar, 2017, Dynamic reliability estimation based on closed loop Girsanov’s controls, accepted for presentation at the 12th International Conference on Structural Safety and Reliability, 6-10 August 2017, Vienna, Austria.
2. Sonal Dhanvijay and C S Manohar, 2017, Markov Chain Splitting Methods in Structural Dynamic Testing for Estimating Time Variant Reliability, accepted for presentation at the 12th International Conference on Structural Safety and Reliability, 6-10 August 2017, Vienna, Austria.

3. Sonal Dhanvijay and C S Manohar, 2016, Structural reliability modeling through intelligent testing, Proceedings of the Structural Engineering Convention, December 21-23, 2016, Chennai.
4. Oindrila Kanjilal and C S Manohar, 2016, Reliability estimation in vibrating structures by Girsanov's transformation with Markov control forces, Proceedings of the Structural Engineering Convention, December 21-23, 2016, Chennai.
5. Oindrila Kanjilal, G Greagar, K Karuna, C S Manohar, and Asif Usmani, 2015, Analysis of heated structures with uncertain properties, The First International Conference on Structural Safety under Fire and Blast, 2-4 September, Glasgow, 2015.
6. C S Manohar, Asif Usmani, and G Ramachandran, 2014, Resilience of communities and critical infrastructure to man-made and natural hazards: dealing with uncertainty, Edinburgh India Institute, Inaugural Conference: 15-16 May 2014, Edinburgh.
7. C S Manohar, 2013, Instrumented civil engineering structures and structural safety: current research at IISc, Bangalore, Recent advances in civil engineering, KLECET, Belgaum.
8. C S Manohar, 2013, Updating mathematical models in structural engineering, poster presented at the Indo-German Frontiers in Engineering, Hyderabad.
9. C S Manohar, 2012, Condition assessment and updating of mathematical models for existing structures, Poster presented at The Indo-US Frontiers of Engineering Symposium, Washington.
10. S Dewaney, D Lange, A Usmani, and C S Manohar, Development of a performance-based structural fire engineering framework for implementation as a software design tool, 6th International ASRANet Conference 2-4 July 2012, London, Croydon.
11. S Dewaney, D Lange, A Usmani, and C S Manohar, 2012, Adapting the PEER methodology to account for the fire hazard in built structures, First International Conference on Performance-based Life-cycle structural engineering, 5-7, December 2012, Hong Kong.
12. S Abhinav and C S Manohar, 2012, Bayesian Framework for Parameter and Force Identification in Beam-Moving Oscillator Systems, 7th International Workshop on Smart Materials and Smart Structures Technology, ANiCRISST2012, Bangalore.
13. D Sen, B Bhattacharya, C S Manohar, 2012, Reliability of bridge deck subject to random vehicular and seismic loads through subset simulation, Bridge Maintenance, Safety, Management, Resilience and Sustainability - Proceedings of the Sixth International Conference on Bridge Maintenance, Safety and Management, pp. 668-675.
14. Bhargava, P., Sharma, U.K., Singh, Y., Singh, B., Usmani, A., Torero, J., Gillie, M., Manohar, C.S., 2010, Fire testing of an earthquake damaged RC frame, Structures in Fire - Proceedings of the Sixth International Conference, SiF'10, pp. 231-238.
15. B Radhika and C S Manohar, 2011, Structural condition assessment using probabilistic substructuring strategies, Structural Mechanics in Reactor Technology (SMiRT 21), New Delhi, December 2011.
16. V S Sundar and C S Manohar, 2011, Updating reliability models for existing structures using measured responses, Structural Mechanics in Reactor Technology (SMiRT 21), New Delhi, December 2011.
17. A Usmani, D J Lange, A Webb, C S Manohar, and V S Sundar, Reliability of structural members subjected to fire, ASRANet 2010 Conference, Edinburgh, Scotland, 14-16 June 2010.
18. C S Manohar, 2009, Structural reliability in PBSEE, National Telford Institute Workshop on A unified framework for Performance-Based Engineering under Exceptional Conditions, 16-17, Nov 2009, University of Edinburgh, UK.
19. V S Sundar and C S Manohar, 2011, Structural reliability model updating using noisy measurements, under review, Sixth MIT Conference on Computational fluid and solid mechanics, MIT, Boston, June 2011.

20. C S Manohar, 2009, Structural reliability in PBSEE, National Telford Institute Workshop on A unified framework for Performance-Based Engineering under Exceptional Conditions, 16-17, Nov 2009, University of Edinburgh, UK.
21. C S Manohar, 2009, Research into condition assessment of existing structures based on dynamic state estimation methods, Keynote talk, International Conference on Vibration Problems, IIT Kharagpur, 19-22 January 2009.
22. C S Manohar, 2007, Nonlinear Structural System Identification: Recent Research at the Indian Institute of Science, (Keynote Lecture), Proceedings of International Conference on Recent Advances in Structural Engineering, Manipal Institute of Technology, India.
23. C S Manohar, S Venkatesha, M R Karthik and S Ammanagi, 2005, Development of experimental setups for earthquake engineering education, Presented (with laboratory demonstrations) at the National Workshop on Experimental Methods in Earthquake Engineering Research, Indian Institute of Science, Bangalore 10-11, February 2005.
24. C S Manohar and Sayan Gupta, 2004, Seismic PSA of nuclear power plant structures, Proceedings of the 6th Technical Programme Discussion Meeting, Bhabha Atomic Research Centre, Mumbai.
25. C S Manohar and Sayan Gupta, 2005, Prediction of seismic fragility analysis of a fire water system in a nuclear power plant using structural reliability methods, Proceedings of the 7th Technical Programme Discussion Meeting, Bhabha Atomic Research Centre, Mumbai.
26. C S Manohar and Sayan Gupta, 2003, Seismic fragility analysis of a piping structure in a nuclear power plant, Proceedings of National Seminar on Seismic Design of Nuclear Power Plants, Structural Engineering Research Centre, Chennai, India, February 2003, pp. 301-312.
27. Sonjoy Das and C S Manohar, 2003, "Prediction of vibration energy flow variability in random built-up structures, 74th Shock and vibration symposium, October 2003, USA.
28. Sayan Gupta and C S Manohar, 2002, Development of an improved response surface method for computing exceedance probability of Von Mises stress for randomly excited structures, Submitted for possible inclusion in the Proceedings of the 47th Congress of Indian Society of Theoretical and Applied Mechanics, December 2002, Guwhati, Indian Institute of Technology.
29. Luna Majumder and C S Manohar, 2002, Structural damage detection using vibration data: current research at the department of civil engineering at IISc, Proceedings of the Seminar on Structural Dynamics in Civil Engineering, 18 & 19, July 2002, Edited by B K Raghu Prasad, 38-49.
30. C S Manohar and Sayan Gupta, 2001, Nonlinear dynamics of beams with stochastic parameter variations, Proceedings of the IUTAM symposium on nonlinearity and stochastic structural dynamics, IIT Madras, January 3-8, 1999, Edited by S Narayanan and R N Iyengar, Kluwer Academic Publishers, Dordrecht, 133-145.
31. A M Abbas and C S Manohar, 2001, A comparative study on deterministic and stochastic critical earthquake load models, Proceedings of the International Conference in Civil Engineering, ICCE 2001, Volume II, Interline publishing, Bangalore, India, 173-180.
32. Sayan Gupta and C S Manohar, 2001, Computation of reliability of stochastic structural dynamic systems using stochastic FEM & adaptive importance sampling with non-Gaussian sampling functions, Proceedings of the First MIT conference on computational solid and fluid mechanics, MIT, USA, June 12-15, Edited by K J Bathe, 220-223, Elsevier.
33. C S Manohar and Sayan Gupta, 2001, Nonlinear dynamics of beams with stochastic parameter variations, Proceedings of the IUTAM symposium on nonlinearity and stochastic structural dynamics, IIT Madras, January 3-8, 1999, Edited by S Narayanan and R N Iyengar, Kluwer Academic Publishers, Dordrecht, 133-145.
34. Sayan Gupta and C.S. Manohar 2001, Reliability analysis of vibrating structures using stochastic finite element method and adaptive importance sampling, Proceedings of National

- Symposium on Advances in Structural Dynamics and Design, Structural Engineering Research Center, Madras, January 9-11, 2001, 517-523.
35. Sayan Gupta & C.S. Manohar 2000, Stochastic finite element vibration analysis of randomly inhomogeneous structures using dynamic stiffness matrix method, Proceedings of the First International Conference on Vibration Engineering and Technology of Machinery (VETOMAC-1), IISc, Bangalore, October 25-27, 2000, (Ed: Kartik Venkatraman & CS Manohar), paper no: CP041.
 36. C S Manohar and A K Jaiswal, 1998, Nonlinear dynamic analysis of moving vehicle-supporting structure interactions, Proceedings of the 8th National Seminar on Aerospace Structures, 9-10 October 1998, Edited by V Kalyanaraman and P Sriram, Allied Publishers Limited, New Delhi, pp. 340-347.
 37. C S Manohar and Sondipon Adhikari, 1997, Vibration energy flow in trusses: statistical energy analysis, versus stochastic finite element analysis, Recent Advances in Structural Dynamics and Aeroelasticity, Proceedings of the 7th National Seminar on Aerospace Structures, NAL, Bangalore, Editors: S A Hussainy, B K Parida, V Shankar and C G Shah, Allied Publishers, New Delhi, pp. 309-318.
 38. C S Manohar and A K Jaiswal, 1998, Nonlinear dynamic analysis of moving vehicle - supporting structure interactions, proceedings of the 8th National Seminar on Aerospace Structures, 9-10 October 1998, Edited by V Kalyanaraman and P Sriram, Allied Publishers Limited, New Delhi. pp.340-347.
 39. R Ravi, C S Manohar and P Chellapandi, 1996, Comparison of time history and random vibration approach for the generation of floor response spectra, Proceedings of the Symposium on earthquake effects on structures, plant and machinery, New Delhi, November 13-15, 1996.
 40. C S Manohar and B R Shashirekha, 1995, Harmonic response analysis of stochastic rods using spatial stochastic averaging, Proceedings of IUTAM symposium on Nonlinear Stochastic Mechanics, Trondheim, Norway, July 1995, Editors: A Naess and S Krenk, Kluwer Academic Publishers, Dordrecht, pp. 289-298.
 41. C S Manohar and Abhijit Sarkar, 1994, Stochastic seismic critical excitations for engineering structures, Proceedings of the 10th National Symposium on Earthquake Engineering, Roorkee, Ajay Printers, pp. 827-836.
 42. R N Iyengar, C S Manohar and O R Jaiswal, 1994, Field study of the 1993 Latur earthquake, Proceedings of the 10th National Symposium on Earthquake Engineering, Roorkee, Ajay Printers, pp. 1-10.
 43. C S Manohar 1994, Dynamic stiffness matrix for axially vibrating stochastic rods, Proceedings of the National symposium on structural mechanics, Bangalore, 103-109.
 44. C S Manohar and R N Iyengar, 1990, Natural frequencies of simple stochastic systems, in Advances in Structural Testing, Analysis and Design, ICSTAD Proceedings, Bangalore, Tata McGraw-Hill, 302-307.
 45. R N Iyengar and C S Manohar, 1987, Van der Pol's oscillator under combined periodic and random excitations, in Nonlinear Stochastic Dynamical Systems, Edited by F Ziegler and G I Schueller, IUTAM Symposium Innsbruck/Inns, Austria, 1987, Springer Verlag, Berlin, 69-85.
 46. R N Iyengar and C S Manohar, 1985, System dependent critical seismic excitations, M1 5/6, 8th International Conference on Structural Mechanics in Reactor Technology, Brussels, 147-151.
 47. R N Iyengar and C S Manohar, 1984, Extreme seismic excitations, Proceedings of Symposium on Earthquake Effects on Plants and Equipments, BHEL, Hyderabad, Vol.1, 65-69.

5.6 Theses

1. C S Manohar, 1989, Random vibrations of limit cycle systems and stochastic strings, PhD thesis, Department of Civil Engineering, Indian Institute of Science, Bangalore.
2. C S Manohar, 1984, Extreme seismic excitations, ME dissertation project report, Department of Civil Engineering, Indian Institute of Science, Bangalore.

5.7 Technical reports

1. C S Manohar and S Venkatesha, 2012, Vibration based condition assessment and reliability analysis of existing structures, Technical report, Submitted to BRNS, Department of Atomic Energy, Government of India.
2. B Radhika and C S Manohar, 2010, Reliability analysis of existing structures using dynamic state estimation methods, Technical Report, Department of Civil Engineering, Indian Institute of Science, Bangalore.
3. C S Manohar, V R Sonti, and A R Upadhya, October, 2009, Modeling of nonlinearity in experimental structural dynamics, Closure and Final Technical Report, Submitted to Aeronautical R & D Board.
4. C S Manohar, 2009, Numerical simulation of dynamics of an impacting beam, Submitted to Delphi Automotive Systems, Bangalore, as a part of the project on *Analytical prediction of squeak and rattle noise intensity in a seat belt retractor system*.
5. J M Chandra Kishen, Ananth Ramaswamy, and C S Manohar, 2009, Condition Monitoring of Railway Bridges: Plate Girder Bridge (Number 3), Submitted to South Western Railways, Government of India.
6. J M Chandra Kishen, Ananth Ramaswamy, and C S Manohar, 2009, Condition Monitoring of Railway Bridges: Stone Masonry Arch Bridge (Number 20), Submitted to South Western Railways, Government of India.
7. J M Chandra Kishen, Ananth Ramaswamy, and C S Manohar, 2009, Condition Monitoring of Railway Bridges: Plate Girder Bridge (Number 102), Submitted to South Western Railways, Government of India.
8. J M Chandra Kishen, Ananth Ramaswamy, and C S Manohar, 2009, Condition Monitoring of Railway Bridges: Through open web Girder Bridge (Number 139A), Submitted to South Western Railways, Government of India.
9. J M Chandra Kishen, Ananth Ramaswamy, and C S Manohar, 2009, Condition Monitoring of Railway Bridges: Brick Masonry Arch Bridge (Number 128), Submitted to South Western Railways, Government of India.
10. C S Manohar, V R Sonti and A R Upadhya, April 2009, Modeling of nonlinearity in experimental structural dynamics, Third annual report submitted to Aeronautical Research and Development Board.
11. C S Manohar, 2008, Structural reliability under seismic excitation, Report submitted to Cranses Software International Limited, Bangalore.
12. C S Manohar, V R Sonti and V Namdeo, 2007, Modeling of nonlinearity in experimental structural dynamics, Second annual report submitted to Aeronautical Research and Development Board.
13. C S Manohar, V R Sonti and V Namdeo, 2007, Modeling of nonlinearity in experimental structural dynamics, First annual report submitted to Aeronautical Research and Development Board.
14. C S Manohar and Kartik Venkatraman, 2007, Development of dynamic analysis method for rotating parts of hydro turbine, Submitted to Bharath Heavy Electricals Limited Bhopal.

15. C S Manohar, 2006, Seismic probabilistic safety assessment of nuclear power plant structures, Final Project Report, Submitted to Board of Research in Nuclear Sciences, Department of Atomic Energy, Government of India.
16. C S Manohar, V R Sonti and K Renji, 2006, Bayesian updation of finite element sub-structure assemblies using qualification test data, Final project report submitted to ISRO-IISc Space Technology Cell.
17. C S Manohar and Kartik Venkatraman, 2006, Acoustic vibration of sodium to air heat exchangers, Consultancy Project Report, submitted to IGCAR, Kalpakkam.
18. C S Manohar, D Roy, and S Venkatesha, 2006, Environmental vibration survey at the National Centre for Biological Sciences at the proposed site for installing an electronic microscope, Bangalore, Consultancy Project Report, Submitted to NVBS, Bangalore.
19. C S Manohar and Ananth Ramaswamy, 2002-2005, Nonlinear earthquake response analysis and structural optimization of secondary piping networks, Final Report, Submitted to Department of Science and Technology, Government of India.
20. C S Manohar and Sayan Gupta, 2005, Seismic probabilistic safety assessment of nuclear power plant structures, Second Annual Report, Submitted to Board of Research in Nuclear Sciences, Department of Atomic Energy, Government of India.
21. C S Manohar, D Roy and S Venkatesha, 2005, Environmental vibration survey at the Yashodha hospital, Hyderabad at the proposed site for installing a MRI equipment, Consultancy Project Report, Submitted to Wipro GE Health Care.
22. C S Manohar and S Venkatesha, 2005, Development of experimental setups for earthquake engineering education; Part I : Students manual; Part II: Additional notes for the instructors; Part III: Inventory and cost of equipment/setups, Final report submitted to the National Program on Earthquake Engineering Education, MHRD, Government of India.
23. C S Manohar and Kartik Venkatraman, 2004, Vibration response prediction in a flight vehicle, Submitted to Regional Centre Imarat, Defence R& D Organization, Hyderabad.
24. C S Manohar, V R Sonti and K Renji, 2004, Bayesian updation of finite element sub-structure assemblies using qualification test data, Report submitted to ISRO-IISc Space Technology Cell.
25. C S Manohar, 2003, Structural damage detection using vibration data and probabilistic health assessment, Final project report, Submitted to Council of Scientific and Industrial Research, Government of India.
26. C S Manohar and Sayan Gupta, 2003, Seismic probabilistic safety assessment of nuclear power plant structures, First Annual Report, Submitted to Board of Research in Nuclear Sciences, Department of Atomic Energy, Government of India.
27. Sonjoy Das and C S Manohar, 2001, Evaluation of Coupling loss factor matrix for discretely coupled plate assemblies and modeling of vibration flow, Report Submitted to ISRO-IISc Space Technology Cell, No. ISTC/MCV/CSM/1000, Department of Civil Engineering, Indian Institute of Science, Bangalore.
28. C S Manohar, 2001, Seismic evaluation of sodium piping by multiple excitations and determination of critical random excitations, Department of Civil Engineering, Indian Institute of Science, Bangalore, Report submitted to Indira Gandhi Centre for Atomic Research, Kalpakkam.
29. K Venkatraman, C S Manohar and S Gopalakrishnan, 2000, Bearing support stiffness evaluation of Kaveri engine, TR GTRE-IISc-2000, Indian Institute of Science, Bangalore.
30. C S Manohar, Sondipon Adhikari and Subarna Bhattacharyya, 1999, Statistical energy analysis of structural dynamical systems, Final Project report submitted to the Department of Science and Technology, Department of Civil Engineering, Indian Institute of Science, Bangalore.

31. S Vedula, P P Mujumdar and C S Manohar, 1998, Engineering evaluation of Puyankutty hydroelectric project Stage I, Report submitted to Kerala State Electricity Board, Department of Civil Engineering, Indian Institute of Science.
32. C S Manohar and Sondipon Adhikari 1997, Stochastic dynamics stiffness method for vibration and energy flow analyses of skeletal structures, First Annual Report submitted to Department of Science and Technology, Department of Civil Engineering, Indian Institute of Science.
33. C S Manohar, 1996, Dynamics of extensible cables, Final report submitted to the DST, Department of Civil Engineering, Indian Institute of Science.
34. C S Manohar and Ananth Ramaswamy 1996, Dynamics of mechanically launched bridges, Consultancy project report submitted to Research and Development (Engineers), Defence Research and Development Organization, Pune.
35. C S Manohar and Abhijit Sarkar, 1995, Dynamics of extensible cables, Report submitted to the DST, Department of Civil Engineering, Indian Institute of Science.
36. A J Keane, C S Manohar and W J Wang, 1994, Research into confidence estimates in statistical energy analysis, Oxford University Engineering Laboratory report No. 2008/94.
37. A J Keane and C S Manohar, 1992, Joint ISVR-Oxford Program of Research into Confidence Estimates in Statistical Energy Analysis, First Annual Report, Department of Engineering Science, University of Oxford.
38. A J Keane and C S Manohar, 1992, Joint ISVR-Oxford Program of Research into Confidence Estimates in Statistical Energy Analysis, Second Progress Report, Department of Engineering Science, University of Oxford.
39. A J Keane and C S Manohar, 1992, Joint ISVR-Oxford Program of Research into Confidence Estimates in Statistical Energy Analysis, Second Annual Report, Department of Engineering Science, University of Oxford.
40. C S Manohar, K Balaji Rao and T V S R Appa Rao, 1991, Mathematical modeling of dynamic wind effects on chimneys: a review of literature, Project report no. STS-RR-91-1, Structural Engineering Research Centre, Madras.
41. C S Manohar and A J Keane, 1991, Joint ISVR-Oxford Program of Research into Confidence Estimates in Statistical Energy Analysis, First Progress Report, Department of Engineering Science, University of Oxford.
42. C S Manohar and R N Iyengar, 1990, Random Vibration of Limit Cycle Systems, Department of Civil Engineering, Indian Institute of Science, India.

5.8 Edited volumes

1. D Roy and C S Manohar, Guest Editors, 2006, Special issue on Probabilistic Structural Dynamics and Earthquake Engineering, Sadhana- Academy Proceedings in Engineering Science, Indian Academy of Sciences, Bangalore, 31(4), 291-487.
2. C S Manohar and D Roy, 2005, Proceedings of National Symposium on Structural dynamics, random vibrations and earthquake engineering, Indian Institute of Science, Bangalore.
3. Kartik Venkatraman and C S Manohar (Editors), 2000, Proceedings of International Conference on Vibration Engineering and Technology of Machinery, October 2000, Bangalore, Published on CD by Microart Multimedia Solutions, Bangalore, India.

5.9 Research monographs (based on research theses written under my supervision)

1. Sayan Gupta and C S Manohar, 2009, Reliability analysis of randomly vibrating structures, Lambert Academic Publishing, Koln, Germany.

2. Sayan Gupta and C S Manohar, 2009, Stochastic dynamic stiffness matrix method, Lambert Academic Publishing, Koln, Germany.
3. H A Nasrellah and C S Manohar, 2010, State estimation techniques: identification of finite element models, Lambert Academic Publishing, Koln, Germany.

6.0 Sponsored Research Projects

1. 2012-2016, Coordinated Research Project titled “Uncertainty Analysis of Engineering and Environmental Systems” submitted to BRNS, Department of Atomic Energy, Government of India; the project is proposed to be coordinated by C S Manohar from IISc and Dr Debanik Roy from BRNS; project duration: three years; total budget: Rs 2.86 crores; the proposal has seven themes listed below:
 - a. Safety and global sensitivity analyses of structures with alternative uncertainty models (PI: C S Manohar; Co-I: M Sekhar)
 - b. Stochastic Modeling of Hydration Process in Concrete: Investigation into Creep and Shrinkage (PI: Ananth Ramaswamy; Co-Is: K Sajeew and C S Manohar)
 - c. Petrographical, Chemical and Computational Studies on Concrete at High Temperature (PI: K Sajeew, Co-Is: Ananth Ramaswamy and C S Manohar)
 - d. Studies on Fatigue Crack Growth in Graphite (PI: J M Chandra Kishen; Co-I: C S Manohar)
 - e. Uncertainty quantification in multiscale analysis of nanocomposite materials (PI: D Ghosh, Co-I: J M Chandra Kishen)
 - f. Stochastic modeling of groundwater flow and contaminant transport modeling at the proposed uranium tailings pond (PI: M Sekhar, Co_I: C S Manohar)
 - g. Development of probabilistic design and analysis procedures in radioactive waste disposal in NSDF and design of NSDF closure (PI: G L Sivakumar Babu, Co-I: M Sekhar).

My role: Overall coordination of the project; PI for one of the themes and Co-I for four more themes; provide technical support to all team members in matters related to stochastic modeling.

2. 2011-2014, Making performance based engineering for fire resistance attainable, United Kingdom-India Education and Research Initiative (UKIERI), Award under the strand of Innovation partnerships, Joint project between University of Edinburgh and IISc (coordinators: Asif Usmani from Edinburgh and C S Manohar from IISc) [status: project sanctioned for 40000 pounds).
3. C S Manohar and S Venkatesha, 2010-2014, Vibration based condition assessment and reliability analysis of existing structures’, Funded by Board of Research in Nuclear Sciences, Department of Atomic Energy, Government of India (Rs 28.4 lakhs).
4. 2012-2013, Development of a video based course on Finite element method for vibration and stability analyses, funded by National Programme on Technology Enhanced Learning (NPTEL).
5. 2007-2010, Fire resistance and repair of earthquake damaged structures, United Kingdom-India Education and Research Initiative (UKIERI) Collaborative Research Awards 2007, Jointly developed with University of Edinburgh, IIT Roorkee and IISc, Bangalore; Team: Edinburgh: A S Usmani, J L Torero, Pankaj, J F Chen, and M Gillie; IIT Roorkee: Pradeep Bhargava, Yogendra Singh, Umesh Kumar Sharma; IISc: C S Manohar and Ananth Ramaswamy (146000 Pounds).
6. C S Manohar and K Venkatraman, 2006-2008, Analytical prediction of squeak and rattle noise intensity in a seat belt retractor system, Funded by Delphi Automotive Systems, India, (Rs 9.0 lakhs).

7. C S Manohar, 2010, Development of a video based course on Stochastic Structural Dynamics, funded by National Programme on Technology Enhanced Learning, Government of India (Rs 3.0 lakhs) [Course material including videos, ppt files and assignments available at <http://nptel.iitm.ac.in/courses/105108080/>].
8. C S Manohar and V R Sonti, and A R Upadhya, 2005-2009, Modeling of nonlinearity in experimental structural dynamics, Aeronautical Research and Development Board, Government of India (Rs 17.9 lakhs)
9. J M Chandra Kishen, Ananth Ramaswamy, C S Manohar, and D Roy, 2006-2009, Condition monitoring of railway bridges, Funded by Indian Railways (South Central Division), Government of India (Rs 74.5 lakhs).
10. D Roy and C S Manohar, 2004-2007, Development of numerical methods for structural reliability analyses, Funded by Board of Research in Nuclear Studies, Department of Atomic Energy, Government of India (Rs 12.0 lakhs).
11. C S Manohar and J M Chandra Kishen, 2002-2006, Seismic Probabilistic Safety Assessment (PSA) of nuclear power plants, Funded by Board of Research in Nuclear Studies, Department of Atomic Energy, Government of India (Rs 16.0 lakhs).
12. C S Manohar and Ananth Ramaswamy, 2002-2005, Nonlinear earthquake response analysis and structural optimization of secondary piping networks, Funded by Department of Science and Technology, Government of India (Rs 9.78 lakhs).
13. C S Manohar, and S Venkatesha, 2004-2005, Development of experimental setups for earthquake engineering education, Funded by National Program on Earthquake Engineering Education, Ministry of Human Resources Development, Government of India (Rs 4.0 lakhs).
14. C S Manohar and V R Sonti, 2003-2005, Bayesian updation of finite element sub-structure assemblies using qualification test data, Funded by Indian Space Research Organization-Indian Institute of Science Space Technology Cell, (Rs 5.03 lakhs).
15. C S Manohar, 2001-2004, Structural damage detection using vibration data and probabilistic health assessment, Funded by Council of Scientific and Industrial Research, Government of India (Rs 11.8 lakhs).
16. C S Manohar, 1999-2001, Evaluation of coupling loss factor matrix for discretely connected plate assemblies and modeling of vibration energy flow, Funded by Indian Space Research Organization-Indian Institute of Science Space Technology Cell, (Rs 3.74 lakhs).
17. C S Manohar, 1996-1999, Statistical energy analysis of engineering structures, Funded by Department of Science and Technology, Government of India (Rs 6.54 lakhs).
18. A Sridharan and C S Manohar, 1994, Investigation of strain fields in zones of recent seismicity in Southern peninsular India, Funded by Council of Scientific and Industrial Research, Government of India (Rs 1.5 lakhs).
19. R N Iyengar and C S Manohar, 1993-1997, Dynamics of extensible cables, Funded by Department of Science and Technology, Government of India (Rs 9.54 lakhs).

7.0 Research Supervision

7.1 Ph D Theses (Completed)

1. S Ammanagi, 2016, Vibration testing of structures under random support excitations, Under External Registration Programme from BISS, Bangalore and under joint supervision with Dr R Sunder
2. V S Sundar, 2014, PhD thesis, Monte Carlo simulations with variance reduction for structural reliability modeling, updating and testing
3. B Radhika, 2012, PhD thesis, Monte Carlo simulation based response estimation and model updating in nonlinear random vibrations.

4. H A Nasrellah, 2009, PhD, Dynamic state estimation techniques for identification of parameters of finite element structural models.
5. R Sajeeb, PhD, 2009, Novel strategies for real-time substructuring, identification and control of nonlinear structural dynamical systems, (Joint supervision with Prof D Roy).
6. M Manjuprasad, 2005, PhD, Stochastic finite element analysis and safety assessment of structures under random excitations, Under external registration program and with joint supervision with Dr K Balaji Rao of Structural Engineering Research Centre Chennai, India.
7. Sayan Gupta, 2004, PhD, Reliability analysis of randomly vibrating structures with parameter uncertainties.
8. A M Abbas, 2002, PhD, Deterministic/reliability-based critical earthquake load models for linear /nonlinear engineering structures.
9. S Abhinav, 2016, Stochastic modeling of vehicle-structure interactions: dynamic state and parameter estimation, and global response sensitivity analysis

7.2 PhD theses (Under progress)

10. S D Sajish, (2010-present), PhD thesis, Research in the area of earthquake response of shell structures, Under External Registration Program from IGCAR, Kalpakkam and with joint supervision with Dr P Chellapandi.
11. S Venkatesha, (2011-present), PhD thesis, in the area of nonlinear system, Under staff registration program.
12. G George, (2012-present), PhD thesis in the area of treatment of uncertainty in performance based structural engineering.
13. D Sonal, (2012-present), PhD thesis in the area of multiple model selection in structural engineering.
14. K Oindrilla (2014-present), PhD thesis in the area of computational reliability modeling in structural dynamics.
15. K Karuna (2015-present), PhD thesis in the area of modeling aleatory and epistemic uncertainties in structural safety assessment.
16. T Bharathi (2014-present) Research in the area of flow through random porous media (Joint guidance with Prof M Sekhar).
17. A S Nisha, (2015-present) Research in the area of hybrid simulations in structural dynamics (Student under the QIP program).
18. Sk Rajib Ali, (2016-present), PhD thesis, Research in the area of reliability modeling of electronic control units in automotive systems (under ERP from Robert Bosch Engineering and Business Solutions and with joint supervision with Dr Sudarshan Hegde).

7.3 MSc (Engineering) Theses

1. K Karuna, 2015, MSc(Engineering), Structural safety analysis with alternative uncertainty models.
2. S D Sajish, 2011, MSc (Engineering), Reliability and response uncertainty analyses of nuclear power plant components under seismic loading, Under External Registration Program from IGCAR, Kalpakkam and with joint supervision with Dr P Chellapandi.
3. R Sivaprasad, 2009, MSc (Engineering), Steady state dynamics of systems with fractional order derivative damping models, Under external registration program and with joint supervision with Dr K G Manoj, General Electric India Technology Centre, Bangalore.
4. Satya Swaroop Panda, 2008, MSc (Engineering), Development of methods for structural reliability analysis using design and analysis of computer experiments and data based

extreme value analysis, Under external registration program and with joint supervision with Mr A S Mariasundaram, General Electric India Technology Centre, Bangalore.

5. S Venkatesha, 2007, MSc (Engineering), Inverse sensitivity methods for structural damage detection using vibration data.
6. Vikas Namdeo, 2007, MSc (Engineering), Novel strategies for nonlinear structural system identification using particle filtering and force state map construction.
7. S Ghosh, 2007, (MSc Engineering) Novel sub-optimal and particle filtering strategies for identification of nonlinear structural dynamical systems, Joint supervision with Prof D Roy.
8. Saikat Saha, 2003, MSc (Engineering), Inverse reliability based structural design for incompletely specified earthquake loads.
9. Arunasis Chakraborty, 2003, MSc (Engineering), Dynamic response of structures under random multi-component earthquake excitations.
10. Luna Mujumder, 2002, MSc (Engineering), Bridge damage detection using vibration data on vehicle-structure interactions.
11. Sonjoy Das, 2001, MSc (Engineering), Vibration energy flow analysis in randomly parametered coupled plate structures using Green's function coupling technique.
12. Sayan Gupta, 2000, MSc (Engineering), Vibration analysis of structures built-up of randomly inhomogeneous curved and straight beams using stochastic dynamic stiffness matrix method.
13. Ch Srinivas, 1998, MSc (Engineering), Critical cross power spectral density models for earthquake loads on multi-supported structures
14. Subarna Bhattacharyya, 1998, MSc (Engineering), Vibration analysis of randomly parametered frame structures with non-Gaussian inhomogenities using Monte Carlo simulations.
15. A K Jaiswal, 1998, MSc (Engineering), Nonlinear dynamic analysis of moving vehicle-supporting structure interactions and modeling of critical guide way unevenness profiles.
16. Sondipon Adhikari, 1997, MSc (Engineering), Stochastic dynamic stiffness method for vibration and energy flow analyses of skeletal structures.
17. R Ravi, 1997, MSc (Engineering), Random earthquake response analysis of multiply supported nuclear power plant secondary systems.
18. Abhijit Sarkar, 1995, MSc (Engineering), Critical Stochastic seismic excitation models for engineering structures.

7.5 ME dissertation project supervision

1. T Srikanth, 1995, Critical cross spectra for multi-support and multi-component earthquake excitations.
2. R Chandrasekhar, 1995, Statistical analysis of frequency response of stochastic continuous structural elements.
3. V Deshmukh, 1995, Numerical investigations on vibrational energy confinement in monocoupled cyclically periodic structures.
4. B Manohar Rao, 1996, Computation of vibration of beams under moving mass.
5. Y Verma, 1996, Identification of damping in Aluminum Conductor Steel Reinforced (ACSR) cable elements.
6. B Anoop, 1997, Finite element analysis of vibration confinement due to disorder.
7. Ashish Khare, 1999, Studies on finite element model updating for skeletal structures.
8. P R Sreecharana, 1999, Studies on response spectrum based methods for earthquake response analysis of multi-supported piping structures.
9. K Kasi Viswanatha Reddy, 1999, Moving vehicle supporting structure interaction problems using finite element methods.
10. Akhilesh Mishra, 2000, Transient earthquake response analysis of liquid storage tanks using FEM and the determination of Critical random earthquake excitations.

11. Kamendra Singh, 2000, Seismic analysis of multi-supported rotors using finite element method.
12. Debraj Ghosh, 2001, Structural damage detection using dynamics model updating.
13. Lalit Mishra, 2002, A time domain method for identification of nonlinear dynamic systems.
14. K Someshwar Rao, 2002, A new modal combination rule for seismic analysis of multiply supported structures using critical cross power spectral density functions.
15. Deepak Kumar, 2002, A comparative study on Time/Frequency domain methods for FE model updating.
16. N Giridhar Singh, 2002, Bayesian updating of coupled FE structural dynamic models.
17. Rohin Kumar Gupta, 2002, Experimental and computational studies on detection of damages in building frame models using a time domain formulation.
18. Saidi Reddy, 2003, P-delta effects in seismic analysis of industrial piping structures.
19. Dileep Singh, 2003, Seismic fragility analysis of liquid storage tanks.
20. Aditya Prasad, 2004-05, Optimal placement of seismic restraints in piping structures.
21. R Tipi Reddy, 2004-05, Structural system identification using nonlinear filtering tools.
22. M Tandon, 2005-06, Analytical and experimental studies into earthquake response of flexible liquid storage tanks.
23. N Shukla, 2005-06, Stability of lattice towers under wind loads.
24. B Satish, 2006-07, Nonlinear structural system identification.
25. Dibakar Datta, 2007-2008, Studies on nonlinear structural system identification.
26. R Rajender, 2007-2008, Structural system identification based on inverse sensitivity analysis of singular solutions of FRF matrix.
27. T Charan Raj, 2008-2009, Bayesian filtering and eigen realization algorithms for structural system identification.
28. Prasanth Babu Koganti, 2009-2010, Dynamic interactions between cracked beams and moving oscillators.
29. T Sathish, 2010-2011, Modeling of vehicle structure interaction using substructuring technique.
30. U Prerana, 2011-2012, Finite element model updating based on unit influence line and its application to condition assessment of bridges.
31. D Sonal, 2011-2012, Pseudo-dynamic testing of building frames under single component earthquake loading.
32. S Abhilash, 2012-2013, Stress and reliability analysis of structures under fire load.
33. K Oindrila, 2012-2013, Markov chain splitting methods for structural reliability analysis.
34. Shubhayan De, 2012-2013, Bayesian model selection problems in structural engineering.
35. P Mani Kiran, 2013-14, Structural vibration due to sudden loss of members.
36. Y Srinivas, Residual displacements in inelastic dynamical systems.
37. Rakesh Ranjan, 2013-14, Reliability analysis of composite beams subjected to fire load.
38. Rajdip Nayek, 2013-14, Sampling variance reduction in random vibration testing of actively controlled structures.
39. Indranil Hazra, 2015-16, Dynamics of rotationally periodic structures: probabilistic and group theoretic approaches.
40. Pramod Kumar Singh, 2015-16, Effects of ambient thermal variability on dynamic properties of a steel bridge structure.
41. Rahul Kolchar, 2016-17, Computational aspect of pseudodynamic testing with substructuring for structures under earthquake, vehicular, and (or) fire loads.
42. Mehr Soni, 2016-17, Global response sensitivity analysis of random seismic global damage indices in inelastic degrading structures.
43. Nithin Raj, 2016-17, Applications of independent component analysis in vibration signal processing and multivariate non-Gaussian data modeling in reliability analysis.

44. T Sreelakshmi, 2016-17, Simulation of seismic pounding in elastic/inelastic cluster of buildings.
45. S Naveen. 2017-18, Work in the area of dynamics of systems with polymorphic uncertainties.
46. Saurabh Sarda, 2017-18, Work in the area of progressive collapse modeling.
47. G Siva Nagasri Alekhya, 2017-18, Work in the area of hybrid simulations.

8.0 Teaching, Research Seminars, and Lectures

8.1 Graduate level teaching at IISc Bangalore (1993- present)

1. Fire Structural Engineering, newly developed course 2016, 2017 (developed jointly with Prof H S Mukunda).
2. Advanced structural dynamics, 2016,2017.
3. Structural system identification (3:0; newly developed elective taught during 2005, 2007, 2008, 2010)
4. Finite element method for structural dynamic and stability analyses (3:0; newly developed elective taught during 2010, 2011, 2012, 2013)
5. Monte Carlo simulations in structural mechanics (3:0; newly developed elective, taught during 2011, 2012, 2013)
6. Nonlinear finite element method in structural engineering (2014, 2015) Newly developed elective course.
7. Random vibration and structural reliability analyses (3:0; elective taught during 2006, 2009, 2011, 2012, 2015).
8. Structural reliability (3:0; newly developed elective taught during 2000, 2003, 2004)
9. Structural dynamics (3:0; core course taught during 1993, 1999, 2000, 2003, 2004, 2005, 2006, 2007, 2008, 2016, 2017).
10. Nonlinear structural mechanics (3:0; core course taught jointly with Profs J M Chandra Kishen and Ananth Ramaswamy during 2008, 2009, 2010).
11. Experimental structural mechanics (0:1; core course taught jointly with faculty members from structural engineering group during 2002, 2003, 2004, 2005).
12. Experimental Structural Dynamics (2:1; elective taught jointly with Dr V R Sonti during 2001, 2002).
13. Structural stability (3:0; elective taught during 2003, 2005, 2005). To be offered during Jan 2014 as a core course.
14. Applied Random Vibrations (3:0; elective taught during 1993, 1994, 1995, 1996)
15. Finite Elements in Structural Dynamics (3:0 elective taught during 2000, 2002)
16. Structural Vibration Control (2:0; elective taught during 1997, 1998)
17. Random vibrations and wavelet analyses (2:0; newly developed elective taught during 2000).
18. Solid Mechanics (3:0; core course; taught during 1994, 1995, 1996, 1997, 1998).

8.2 Undergraduate teaching at IISc

- Elements of solid mechanics, January 2017.

8.3 Teaching at the University of Oxford, UK (1991-93)

1. Tutor for engineering mathematics for undergraduate students
2. Demonstrator, Machine dynamics laboratory.

8.4 Short courses taught outside IISc

1. 2010, Instructor, A short course on basics of mechanical vibrations, 10 hours of lectures, ISRO Satellite Centre, Bangalore; Audience: Engineers from various ISRO labs.
2. 2009, Instructor, A Short course on Structural safety analysis and reliability based design, 18 hours of lectures, School of Engineering, University of Edinburgh, 13-16 July 2009; Audience: Faculty members and research students from University of Edinburgh, Glasgow University, and Heriot Watt University, Scotland.
3. 2006, Instructor, A Short course on Structural System Identification, a set of 12 lectures, delivered at EACoE, JWFTC, Bangalore (GE, India); Audience: Engineers from GE, India.
4. 2003, Instructor, A short course on random vibration analysis, Six hours, Department of Civil Engineering, University of Delaware, USA; Audience: faculty members and doctoral students.
5. 2001, Instructor, A course on Structural reliability analysis and reliability based design, Bhabha Atomic Research Centre, Mumbai, a set of 25 lectures, Audience: Scientists from Bhabha Atomic Research Centre, Atomic Energy Regulatory Board and Nuclear Power Corporation.

8.5 Research Seminars/Colloquia

1. 2016, Condition assessment of ageing railway bridges, Pre-conference workshop on Structural Integrity, SICE-2016, IISc, Bangalore, 2nd July 2016.
2. 2016, Safety of Engineering Structures: Prediction, Diagnosis, and Prognosis, Invited Lecture, Professor G S Ramaswamy Memorial Lecture on the occasion of the CSIR-SERC Foundation day, 10th June 2016, CSIR-Structural Engineering Research Centre, Chennai
3. 2016, Finite element model updating and condition assessment of existing structures, as a part of Symposium of Vibration analysis and correlation, May 2016, Organized by Prosim India, Bangalore.
4. 2015, Challenges in structural health monitoring of ageing bridges, IIT Hyderabad Center of Excellence in Sustainable Development and IC-IMPACTS, India-Canada Workshop, Sustainable Infrastructure and Materials, January 13 2015, Hyderabad
5. 2015, Advances in Structural health Monitoring for Ageing Infrastructure, TEQIP Winter School on Recent Advances in Structural Engineering and Materials, IIT Hyderabad, 14 January 2015.
6. 2015, Reliability analysis of randomly vibrating structures-Current research at the Indian Institute of Science, University College of Villupuram [as a part of International Conference on Advances in Mechanical Engineering, 15-16 October 2015].
7. 2014, Engineering for Structural Safety: Prescriptive Codes, Performance Based Structural Engineering, and Consequence Based Design, Ambedkar Institute of Technology, Bangalore.
8. 2014, IIT Delhi, Bayesian methods for model updating in instrumented structures, as a part of the International Workshop on Emerging Trends in Earthquake Engineering & Structural Dynamics, Structural Engineering Convention (SEC) 2014, Department of Civil Engineering, Indian Institute of Technology (IIT) Delhi, December 20th - 21st, 2014.
9. 2014, Random vibration testing with controlled samples, University of Southampton, UK.
10. 2013, IIT Kanpur, Research into stochastic structural dynamic testing and reliability model updating [as a part of the Pravartana 2013, TEQIP Symposium on Mechanics].
11. 2013, On engineering safe structures, Institute Colloquium, Indian Institute of Science.

12. 2012, Bayesian methods for model updating in structural engineering, University of Swansea, UK.
13. 2011, Probabilistic methods for updating mathematical models of instrumented structures, University of Waterloo, and Carleton University, Canada.
14. 2011, Research into Probabilistic methods for structural system identification and Reliability model updating, Indian Institute of Technology, Kharagpur.
15. 2011, Combining numerical and computational models in structural engineering, VNIT, Nagpur.
16. 2010, Dangers from earthquakes and engineering strategies to face them, Colloquium, National Centre for Biological Sciences, Bangalore.
17. 2010, R & D work in the area of structural reliability at IISc, Indian Institute of Technology, Kharagpur.
18. 2009, Finite element model updating in condition assessment of existing railway bridges, Department of Civil Engineering, Indian Institute of Science.
19. 2009, Prospects for collaborative research in the area of reliability analysis of existing structures, BARC, Mumbai.
20. 2009, Condition assessment and reliability analysis of existing structures, Department of Civil Engineering, IIT Kanpur
21. 2009, Time domain structural model updating using dynamic state estimation methods, National Aerospace Laboratories, Bangalore.
22. 2009, Structural reliability in PBSE, National Telford Institute Workshop, 16-17 November, 2009, School of Engineering, The University of Edinburgh, UK.
23. 2008, Research into condition assessment and reliability analysis of existing structures, School of Engineering, University of Edinburgh.
24. 2007, Novel strategies for structural system identification and reliability analyses of existing structures, Department of Civil Engineering, Indian Institute of Science, Bangalore.
25. 2007, Nonlinear structural system identification using dynamic state estimation methods, Department of Civil Engineering, Indian Institute of Technology, Kanpur.
26. 2007, Probabilistic methods in nonlinear structural system identification, Department of Civil Engineering, Indian Institute of Technology, Kharagpur.
27. 2003, Reliability analysis of randomly parametered structural dynamical systems, Department of Civil and Environmental Engineering, University of Delaware, USA.
28. 2003, Engineering structures under partially specified earthquake loads: Method of critical excitations and design based on inverse reliability, Department of Civil and Environmental Engineering, University of Delaware, USA.
29. 2003, Reliability analysis of randomly parametered structural dynamical systems, Department of Civil Engineering, The Johns Hopkins University, Baltimore, USA.
30. 2001, Reduced order modeling in structural dynamics, Gas Turbine Research Establishment, Bangalore.
31. 1997, Earthquake response analysis of multiply supported piping structures using method of critical excitations, Indira Gandhi Centre for Atomic Research, Kalpakkam.
32. 1997, Finite element analysis of vehicle structure interactions, Aeronautical Development Establishment, DRDO, Bangalore.
33. 1994, Stochastic finite element method for dynamic analysis of engineering structures, Department of Mechanical Engineering, Indian Institute of Science, Bangalore.
34. 1991, Dynamics of an uncertain axially vibrating rod, Department of Engineering Science, University of Oxford, UK.

8.6 Lectures during Continuing Education Programmes at IISc

1. Instructor, 2016, Mechanical Behavior of Structures Under Fire , One week Short Term Course on Fire Safety , 27 June – 2nd July 2016, Jain University, Bangalore.
2. Instructor, 2015, Set of three lectures on Markov processes, Monte Carlo simulation and importance sampling, and Kalman filter and applications in structural engineering, BARC, Mumbai.
3. Instructor, 2014, Set of six lectures on computational stochastic mechanics, MNIT, Jaipur.
4. Instructor, 2012, 5th Asia-Pacific Summer School on Smart Structures Technology, Bangalore; Delivered three lectures on finite element method for structural dynamics.
5. Instructor, 2012, Advanced course on Uncertainty Handling in Structural Engineering, SERC, Madras; delivered a lecture on Random processes in structural engineering.
6. Invited Speaker, 2007, One-week tutorial workshop on Advanced Control Systems, Indian Institute of Science, Bangalore, 10-14 September 2007, Title of the lectures: State estimation methods.
7. Course Instructor, 2007, Short term course on finite element methods in earthquake engineering, funded by National Program on Earthquake Engineering Education, MHRD, IISc, Bangalore.
8. Instructor, 2005, Course on Earthquake effects on structures (22 hours) and vibration isolation (8 hours), March 2005, Indian Institute of Science. Instruction as a part of the National Program on Capacity Building of Engineers in Earthquake Risk Management, Ministry of Home Affairs, Government of India.
9. Course faculty, 2005, Short term course on Seismic resistant design of masonry and reinforced concrete buildings, Indian Institute of Science, Bangalore, Delivered 3 hours of lectures on Introduction to structural dynamics.
10. Course faculty, 2004, One-semester program on earthquake engineering, taught a graduate level course with 48 hours of lectures on Applied Mathematical Methods.
11. Course faculty, 2004, Short-term course on Structural damage assessment, vulnerability and retrofit, Delivered a set of 9 hours of lectures covering structural fragility and vulnerability analyses, role of experiments in earthquake engineering, structural damage detection using vibration data and spectrum compatible PSD and time histories.
12. Course faculty, 2004, Short-term course on Structural dynamics in earthquake engineering, Delivered a set of 12 lectures covering basics of structural dynamics and finite element methods for vibration analysis.
13. Course faculty, 2004, Short-term course on Geotechnical aspects of earthquake engineering, Delivered a set of 3 hours of lectures covering computational methods in structural dynamics.
14. Course faculty, 2004, Short-term course on Probabilistic methods in earthquake engineering, Delivered a set of 18 hours of lectures covering random process modeling, structural reliability analysis, seismic fragility analysis and Monte Carlo simulation methods.
15. Invited faculty, 2003, Short-term course on Fundamentals of Earthquake Engineering, Delivered 9 hours lectures on basics of vibration analysis.
16. Invited faculty, 2001, Course on FEM for engineers, Organized by CSM-Nastran, Bangalore, Delivered a set of nine lectures covering finite element modeling of vibrating structures.
17. Course coordinator and instructor, 1998, Short-term course on Probabilistic Structural Mechanics, Organized by Centre for Continuing Education, Indian Institute of Science, Bangalore, August 1998.
18. Invited faculty, 1997, Short-term course on Structural design for dynamics loads, Organized by Centre for Continuing Education, Indian Institute of Science, Bangalore.
19. Invited faculty, 1997, Short-term course on Optimization: theory and applications in engineering, Organized by Centre for Continuing Education, Indian Institute of Science, Bangalore, 1997.

20. Invited faculty, 1996, Short-term course on FEA for practicing engineers, Centre for Scientific and Industrial Consultancy.

8.7 General lectures and lectures of tutorial nature delivered outside IISc

1. Invited speaker, 2012, Faculty development programme on earthquake resistant design of structures, BLD College of Engineering, Bijapur; delivered 5 hours of lectures on principles of structural dynamics and vibration control.
2. Invited Speaker, 2010, AICTE sponsored Short term training programme on Advanced applications of finite element method, SVNIT, Surat, 4 hours of lectures on application of FEM for structural dynamic analysis.
3. Invited talk, 2009, BVB College of Engineering and Technology, Recent trends in earthquake engineering as a part of the NPCBEERM course on earthquake resistant design.
4. Invited talk, 2009, Matlab as a computational platform for modeling uncertainties in engineering, Workshop on Matlab/Maple and its applications in Engineering, MSRIT, Bangalore.
5. Invited speaker, 2008, Short term training programme on Design of Earthquake Resistant Structures, Basaveshvara College of Engineering, Bagalkot, delivered a set of six lectures on structural dynamics.
6. Invited speaker, 2008, NISA users' conference, Bangalore, organized by Cranes Software International Limited, title of the talk: Combined finite element and experimental modeling in structural dynamics.
7. Invited speaker, 2007, CEP Course on Aero-Mechanical System Design, Aeronautical Development Establishment, DRDO, Bangalore.
8. Invited Speaker, 2007, Training and Education Programme for Engineers and Architects in Earthquake Engineering, Government of India-UNDP Programme on Urban Earthquake Vulnerability Reduction Programme, Cochin University of Science and Technology; title of the module: Introduction to seismic hazard and design philosophy.
9. Invited speaker, 2007, Pre-Conference workshop on Advanced Finite element method and Computational Techniques, Manipal; title of the lecture: Combining numerical and experimental models in structural engineering.
10. Invited speaker, 2007, Research needs and laboratories, National Workshop on Earthquake Engineering Education in India: Looking ahead, 5 January 2007, IIT Delhi.
11. Invited Speaker, 2006, CEP course on "Structural Health Monitoring - Techniques and Computation", R&D Engineers, DRDO, Government of India, Pune.
12. Invited faculty, 2002, Continuing Education Program course on Nonlinear problems in vibration engineering, Regional Research Centre, Defence R & D Organization, Hyderabad.
13. Invited faculty, 2002, Continuing Education Program course on Digital signal processing in mechanical engineering-hardware, algorithms and applications, Aeronautical Development Establishment, Defence R & D Organization, Bangalore. Delivered a lecture on Modeling and simulation of random processes.
14. Invited faculty, 2002, Advanced course on risk analysis and reliability-based design of structures, Organized by Structural Engineering Research Centre, Chennai. Delivered two lectures on Introduction to random processes.
15. Invited faculty, 2002, Continuing Education Program course on Nonlinear problems in vibration engineering, Regional Research Centre, Defence R & D Organization, Hyderabad. Delivered a set of six lectures covering qualitative behavior of nonlinear systems and dynamics of parametrically excited systems.
16. Invited faculty, 2002, Matlab for scientists and engineers, Organized by Bangalore University, Delivered 3 hours of lecture-cum-demonstration on Monte Carlo simulations in structural engineering.

17. Invited faculty, 2001, Advanced Technical Education Programme on Seismic Design & Analysis of Power Plant Equipment and Valves, Bharath Heavy Electricals Limited, Trichy. Delivered a set of six lectures on Earthquake response of structures, Random vibration approach to earthquake response analysis, and earthquake response of piping structures.
18. Invited Faculty, 2001, Continuing Education Program course on Modal analysis and testing, Regional Research Centre, Defence R & D Organization, Hyderabad. Delivered three lectures on FE model updating and structural damage detection using vibration data.
19. Invited faculty, 2001, Short-term course on Seismic analysis of structures, Organized by Regional Engineering College, Nagpur; delivered a set of four lectures on finite element modeling of vibrating systems.
20. Invited faculty, 2001, Advanced course on risk analysis and reliability-based design of structures, Organized by Structural Engineering Research Centre, Chennai.
21. Invited faculty, 2001, Course on Matlab Statistics Toolbox. Organized by Cranes Softwares, Bangalore, Delivered 3 hours of lecture on the Statistics tool box and Monte Carlo Simulations in engineering.
22. Invited speaker, 2001, Workshop on Recent trends in structural dynamics, Organized by Ghousia College of Engineering, Ramanagaram, Delivered a talk on Modeling of structural dynamic systems.
23. Invited faculty, Short-term course on Random vibration and applications to earthquake engineering, Organized by Indian Institute of Technology, Kharagpur, 1999.
24. Invited faculty, 1997, Continuing Education Program course on Random vibration theory, testing and analysis, Regional Research Centre, Defence R & D Organization, Hyderabad, 1997; delivered a set of 12 lectures on random vibration and reliability analyses of vibrating systems.
25. Invited faculty, Short course on Aseismic design of structures: random vibration approach, Organized by Indian Institute of Technology, Kanpur, 1997.

9.0 Teaching material developed

1. A suite of 12 experimental setups aimed at facilitating education at under graduate/graduate level in the area of earthquake engineering has been developed with support from the National Program on Earthquake Engineering Education. This work has resulted in a set of three documents, namely,
 - a. a manual for students
 - b. an instructors manual and
 - c. a manual containing details of design and fabrication of the setups.
 A low cost electric motor-driven shake table has also been developed as a part of this activity.
2. A video based course with 40 modules of one hour each on the subject of Stochastic Structural Dynamics has been prepared with support from National Programme on Technology Enhanced Learning. The video modules are accompanied by 40 modules of course notes <http://nptel.iitm.ac.in/courses/105108080>.
3. A video based course with 40 modules of one hour each on the subject of finite element method for structural dynamic and stability analyses has been developed as a part of the NPTEL. <http://nptel.ac.in/downloads/105108141/>.

10. Grants received for conducting continuing education programmes

1. C S Manohar, 2007, Grant from National Programme on Earthquake Engineering Education, Ministry of Human Resources Development, Government of India, to organize a short-term course on Structural System Identification, (Rs 2.1 lakhs).

2. C S Manohar and S Venkatesha, 2005, Grant from National Programme on Earthquake Engineering Education, Ministry of Human Resources Development, Government of India, to organize a short-term course on Experimental methods in earthquake engineering education, (Rs 2.1 lakhs).
3. C S Manohar, 2004, Grant from National Programme on Earthquake Engineering Education, Ministry of Human Resources Development, Government of India, to organize a one semester long certificate course on Earthquake Engineering (Rs 9.3 lakhs).
4. C S Manohar, 2004, Grant from National Programme on Earthquake Engineering Education, Ministry of Human Resources Development, Government of India, to organize a short-term course on Structural Dynamics in Earthquake Engineering (Rs 2.1 lakhs).
5. C S Manohar, 1997, Grant from All India Council for Technical Education, Government of India, to conduct a short-term course on Probabilistic Structural Mechanics (Rs 1.2 lakhs).

11. Laboratory development at IISc

I have been in-charge of the structural dynamics laboratory at the department of civil engineering since 1993. Some of the facilities that have been developed during this period include: (a) a six-axes earthquake simulator (1m by 1m table driven by a set of eight servo hydraulic actuators with a payload capacity of 500 kg and accelerations up to 2g over a frequency range up to 15 Hz), (b) an L-shaped reaction wall based hybrid testing facility with two 5t and one 10 t servo hydraulic actuators, (c) a 96 channel data acquisition system with facilities for simultaneous measurement of accelerations, strains, displacements, tilt, and temperature, (d) a suite of uni-axial, rotary and multi-axial accelerometers with wide ranging sensitivities, force transducers, dynamic pressure transducers and LVDT-s, (e) instrumented sledge hammer, (f) a set of three electrodynamic shakers, (g) modal analysis software, and (h) three electromechanical shake tables capable of applying periodic support displacements. Funds for creating and maintaining these facilities have been generated through team effort (with funds from X plan grant from IISc and from the National Programme on Earthquake Engineering Education, MHRD, Government of India) and through individual initiatives (with funds from DST, CSIR, ARDB, and Indian Railways). The laboratory has twelve experimental setups for the purpose of teaching different facets of earthquake induced dynamic response of engineering systems. The research focus of the laboratory is on development of hybrid simulation techniques based on nonlinear control principles and on problems of structural system identification and reliability model updating.

12 Industrial consultancy projects

1. C S Manohar, Ananth Ramaswamy, Kusala Rajendran, and S Venkatesha, 2016, Vibration problems encountered in the Mfar Holdings buildings: measurement and identification of possible sources, Funded by Mfar Holdings Private Limited, Bangalore (Rs 5.5 lakhs).
2. J M Chandra Kishen and C S Manohar, 2013, Dynamic analysis of turbo-generator foundation pertaining to the RPCL Thermal Power Project, Funded by Raichur Power Corporation Limited (Rs 9.95 lakhs).
3. C S Manohar, 2006-2008, Structural Reliability Under Seismic Loads, Funded by Cranes Software India Limited, (Rs 14.9 lakhs).
4. C S Manohar and K Venkatraman, 2008, Dynamic analysis of rotating parts of a turbine, Funded by Bharath Heavy Electricals Limited, Bhopal (Rs 5.0 lakhs).
5. C S Manohar and K Venkatraman, 2006, Acoustic vibration of sodium to air heat exchangers, Funded by IGCAR (Rs 3.9 lakhs).

6. C S Manohar and S Venkatesha, 2006, Testing and model validation for simple brackets and lectures on techniques and method used, Funded by John F Welch Technology Centre, General Electricals India, Bangalore (Rs 2.75 lakhs).
7. C S Manohar, D Roy, and S Venkatesha, 2006, Environmental vibration survey at the National Centre for Biological Sciences at the proposed site for installing an electronic microscope, Bangalore, (Rs 0.40 lakhs).
8. C S Manohar, D Roy and S Venkatesha, 2005, Environmental vibration survey at the Yashodha hospital, Hyderabad at the proposed site for installing a MRI equipment, Wipro GE Health Care, (Rs 0.75 lakhs).
9. C S Manohar, 2005, Expert advise and review of Dynamic analysis of Amara Raja battery stack structure for earth quake loading, Client: TCS, Bangalore.
10. C S Manohar and Kartik Venkatraman, 2002-2004, Vibration response prediction in a flight vehicle, Funded by Environmental Test Laboratory, Regional Research Centre, Hyderabad, Defence R & D Organization, Government of India (Rs 4.83 lakhs).
11. C S Manohar, 2002-2003, Aseismic structural reliability analysis of nuclear core support structure, Funded by Indira Gandhi Centre for Atomic Research, Kalpakkam, Department of Atomic Energy, Government of India, (Rs 3.3 lakhs).
12. Kartik Venkatraman, C S Manohar and S Gopalakrishnan, 2000, Bearing support stiffness evaluation studies of Kaveri engine, Funded by Gas Turbine Research Establishment, Bangalore, Defence R & D Organization, Government of India (Rs 4.05 lakhs).
13. C S Manohar, 1998-2000, Seismic evaluation of secondary sodium piping by multiple excitation and determination of critical excitation, 1998-99, funded by Indira Gandhi Centre for Atomic Research, Kalpakkam, Department of Atomic Energy, Government of India (Rs 3.0 lakhs).
14. C S Manohar, 1997-98, Structural dynamic analysis of remotely piloted vehicles during launch phase, Funded by Aeronautical Development Establishment, Bangalore, Defence R & D Organization, Government of India (Rs 1.5 lakhs).
15. S Vedula, P P Mujumdar and C S Manohar, Engineering assessment of Pooyankutty hydroelectric project - Stage I, 1997-98, Funded by Kerala State Electricity Board (Rs 3.75 lakhs).
16. C S Manohar and Ananth Ramaswamy, 1996, Dynamical analysis of mechanically launched bridges, Funded by Research and Development Engineers Establishment, Pune, Defence R & D Organization, Government of India (Rs 3.0 lakhs).

13 Field studies

- Condition assessment of five existing railway bridges in Karnataka with a view to evaluate if the bridges can safely carry proposed increased axle loads.
- Environmental vibration survey at the National Centre for Biological Sciences at the Animal House Facility, 2009.
- Environmental vibration survey at the Yashodha hospital, Hyderabad at the proposed site for installing an MRI equipment
- Environmental vibration survey at the National Centre for Biological Sciences at the proposed site for installing an electronic microscope
- Field investigation of damages during 1984 earthquake in South India
- Deployment of GPS as a part of the project on Investigation of strain fields in zones of recent seismicity in Southern peninsular India.
- Field investigation of the 1993 Latur earthquake.
- Field investigation of the 2000 Bhuj earthquake.
- Field investigation of the 2000 earthquake in South India.

14.0 Professional activities

14.1 Reviewer for the following Journals

ASCE Journal of Engineering Mechanics; ASCE Journal Structural Engineering; ASCE Journal of Bridge Engineering. ASCE-ASME Journal of Journal of Risk and Uncertainty in Engineering Systems; ASME Journal of Vibration and Acoustics; Advances in Acoustics and Vibration; AIAA Journal; Advances in Structural Engineering; Advances in Vibration Engineering [Published by Vibration Institute of India]; ASME Applied Mechanics Reviews (book review); Applied Mathematical Modelling; Communications in Numerical Methods in Engineering; CMES: Computer Modeling in Engineering and Science; Current Science [Current Science Association & Indian Academy of Sciences]; Earthquake Engineering and Structural Dynamics; Earthquake Spectra; Engineering Structures; Europhysics Letters (EPL); Earthquakes and Structures; IEEE Systems Journal; IEEE Transactions on Reliability; International Journal of Nonlinear Mechanics; International Journal of Numerical Methods in Engineering; International Journal for Engineering Analysis and Design; IMA Journal of Applied Mathematics; Journal of Acoustical Society of America; Journal of Sound and Vibration; Journal of Structural Engineering [Published by Structural Engineering Research Centre, India.]; Journal of Indian Institute of Science; Journal of Institution of Civil Engineers, India; ISET Journal of Earthquake Technology; Mathematical Problems in Engineering; Mechanical Systems and Signal Processing; Nuclear Engineering and Design; Probabilistic Engineering Mechanics; Sadhana [Academy Proceedings in Engineering Sciences, Indian Academy of Sciences]; Simulation Modelling Practice and Theory; Soil Dynamics and Earthquake Engineering; Structural Control and Health Monitoring; Reliability Engineering & System Safety; Resonance - Journal of Science Education [Indian Academy of Sciences]; The Shock and Vibration Digest; Smart materials and structures (IOP); ASME Journal of Computational and Nonlinear Dynamics.

14.2 Review of grant proposals, theses & codes

- Council of Scientific and Industrial Research, Government of India.
- Department of Science and Technology
- Board of Research in Nuclear Sciences
- Karnataka State Council for Science and Technology
- Austrian Research Council
- UK-India Education and Research Initiative (UKIERI) research proposal.
- Thesis reviewer
 - IIT Madras (7 PhD theses and 3 MS theses)
 - IIT Mumbai (2 PhD theses)
 - IIT Kharagpur (3 PhD theses)
 - IIT New Delhi (1 PhD thesis)
 - NIT Rourkela (1 PhD thesis)
 - IISc Bangalore (14 MSc[Engg] theses)
 - University of Malaya, Kuala Lumpur (1 PhD thesis)
 - University of Edinburgh (1 PhD thesis)
 - NIT Surat (1 PhD thesis)
- Reviewer for the Indian Seismic Code IS 1893 (Part 1):2002 and Commentary on this code prepared by Profs S K Jain and C V R Murty as a part of the IITK-GSDMA Project on Building Codes.
- Expert member to identify the best paper published in the ISET Journal of Earthquake Technology in the area of structural dynamics for the period 1997-2000 & 2001-2006.

- Expert member, Committee to judge the best ME/M Tech thesis in the area of earthquake engineering, National Information Centre of Earthquake Engineering, Indian Institute of Technology, Kanpur, 2007, 2008, 2009.
- Reviewer of book proposals: Springer, John Wiley, and World Scientific.

14.3 Organization of conferences, workshops and short-term courses

- Session Organizer and Chair, Indo-American Frontiers of Engineering Symposium, Washington, 1-3 March 2012, Organized by the US National Academy of Engineering and Indo-US S&T Forum, (Title of the session: Engineering Large Infrastructure for Disaster/Hazards).
- Session Organizer and Chair, Indo-German Frontiers in Engineering Symposium, March 14-17, 2013, Organized by the Von Humbolt Foundation, Germany and Department of Science and Technology, India, (Title of the session: Engineering for natural disasters and risk management).
- Organizer, Workshop on Fire safety engineering and structures in fire, 9-13 August 2010, IISc, Bangalore; this activity was a part of the project with University of Edinburgh and IIT Roorkee, funded by the UKIERI.
- Course convener, Short-term course on Structural system identification, funded by National Program on Earthquake Engineering Education, MHRD, January 2007.
- Convener, One day discussion meet on Structural Reliability and Stochastic Structural Dynamics, 17th December 2005, Indian Institute of Science; this activity was a part of National Programme on Earthquake Engineering Education, MHRD, Government of India and was held on the occasion of visit of Prof A Der Kiureghian (University of California Berkeley) to IISc.
- Course convener, Short-term course on Experimental methods in earthquake engineering, funded by National Program on Earthquake Engineering Education, MHRD, December 2006.
- Convener and Instructor, Pre-symposium workshop on Monte Carlo Simulation Techniques in Stochastic Structural Mechanics, 20th July 2005.
- Convener, National Workshop on Experimental Methods in Earthquake Engineering Research, Indian Institute of Science, Bangalore 10-11, February 2005. Convener, National Workshop on Experimental Methods in Earthquake Engineering Research, Indian Institute of Science, Bangalore 10-11, February 2005.
- Convener, National Workshop on Experimental Methods in Earthquake Engineering Research, Indian Institute of Science, Bangalore 10-11, February 2005.
- Organizing Secretary, National Symposium on Structural dynamics, random vibrations and earthquake engineering, July 21-22, 2005, Indian Institute of Science, Bangalore.
- Course convener, Semester program on earthquake engineering, funded by National Program on Earthquake Engineering Education, MHRD, August-December 2004.
- Course convener, Short-term course on structural dynamics in earthquake engineering, funded by National Program on Earthquake Engineering Education, MHRD, March 8-13, 2004.
- Organizing Secretary, IISc-Industry Interaction Meet on Vibration problems in engineering, Indian Institute of Science, Bangalore, 2000.
- Organizing Secretary, The first International Conference on Vibration Engineering and Technology of Machinery, October 2000, Bangalore.
- Principal coordinator, Short-term course on Probabilistic Structural Mechanics, Indian Institute of Science, 1998.

- Organizing Secretary, National Seminar on materials and Structures, July 26 1996, Indian Institute of Science.

14.4 Committee membership

- Member, International Scientific Advisory Committee, International Conference on Structural Safety and Reliability (ICOSSAR 2017) Vienna 2017.
- Member 2014, 2016, Selection Committee for selection and promotion of faculty members, VNIT, Nagpur.
- Member, 2013 Selection committee for selection of engineering officers, Central Power Research Institute, Bangalore.
- Member, International Scientific Advisory Committee, International Conference on Structural Safety and Reliability (ICOSSAR 2013) Columbia University, New York City, June 16-20, 2013.
- Member, 2012, Selection Committee for recruitment of Scientists for DRDO, Bangalore.
- Member, 2003-2010, Technical committee on structural dynamics, Engineering Mechanics Division, American Society of Civil Engineers.
- Member, Project Review Committee, 2010-2013, Advanced Facility for Research in Reliability Engineering at Indian Institute of Technology, Kharagpur.
- Expert member, 2010, Committee for selecting faculty members, IIT Hyderabad.
- Expert member, 2011, Focus Group on developing M Tech programme in Structural Engineering, G H Raisoni College of Engineering, Nagpur.
- Member, 2009-present, Board of Studies, Department of Civil Engineering, B V B College of Engineering and Technology, Hubli.
- Expert Member, 2009, Committee to assess Scientists from SERC, Madras (CSIR) for promotion.
- Member, 2007-present, National Advisory Board, National Information Centre of Earthquake Engineering, Indian Institute of Technology, Kanpur.
- Member, Personality Test Board, Union Public Service Commission, Civil Services, Government of India, 2007.
- Member, Expert Committee, Recruitment of faculty members for Department of Civil Engineering, Indian Institute of Science, 2006, 2007.
- Expert member, Committee for Promotion of Superintending Engineers to Chief Engineers, Karnataka Power Corporation Ltd., Bangalore (2007)
- Expert Member, 2008, Committee to assess Scientists from Aeronautical Development Agency (DRDO) for promotion.
- Expert member, 2008, Project review Committee for the project on Structural Health Monitoring, R & D Engineers, DRDO, Pune.
- Member, Academic Council, and Board of Studies in Civil Engineering, BVB College of Engineering and Technology, Hubli, 2007-present.
- Expert Member, Assessment Committee in the area of Material Science and Engineering, CSIR, (2007)
- Member, Program Implementation Committee, National Program on Earthquake Engineering Education, MHRD, Government of India, 2005-2007.
- Member (Nominated), Indian Society for Earthquake Technology, 2005-2007.
- Member, Committee on Shock and Vibration standards for Indian applications: seismic vibrations, Defence and Research and Development Laboratories, Research Centre Imarat-Bureau of Indian Standards (DRDL-RCI/BIS Committee).

- Member, Expert Team to conduct workshops on Need analysis for short-term training programmes in civil engineering, All India Council for Technical Education (AICTE), Government of India, 1996.
- Member, Special technical evaluation committee for procuring structural analysis softwares, Gas Turbine Research Establishment, Bangalore, Defence R & D organization, Government of India, 2002.
- Member, Assessment Committee for considering promotion of engineering officers of the Central Power Research Institute, Bangalore, India, 2004.
- Member, 2004-2009, Doctoral Committee for one PhD Scholar from Anna University, Chennai.
- Expert Member, 2006, Committee on earthquake response of rotors, Bharath Heavy Electricals Limited, New Delhi.

15.0 Administration at IISc

- Chairman, Department of Civil Engineering, December 2010-2013.
- Chairman, Centre for Earth Sciences, July 2007-December 2010.
 - The Centre was established during July 2007 and as the first Chairman of the Centre I coordinated several activities pertaining to the creation of a new Centre. Some of these included: (a) processing of about 125 applications for faculty positions resulting in recruitment of five core faculty members; (b) setting up of laboratory and office spaces; (c) development of a research proposal entitled “Research, Education, and Manpower Development in the Discipline of Earth Processes” (duration: five years; total funds sanctioned : Rs 11.71 crores); implementation of the project for first 14 months involving ordering of equipment costing about Rs 4.25 crores; hiring of post docs and project staff and preparation & presentation of the first year’s progress report; (d) development of the curriculum for a 2-years M Tech programme in the area of Earth System Science.
- Member, Internal Committee Against Sexual Harassment, 2016-present.
- Member, Division level Faculty recruitment Committee, Division of Mechanical Sciences.
- Member, Gate 2016 Question paper checking.
- Member, Committee for admission of sponsored candidates, Division of Earth and Environmental Sciences/ Mechanical sciences, 2010,2011,2012,2013.
- Member, 2007-present, Committee of Professors, Centre for Earth Sciences, IISc.
- Member of Executive Council (2011-present) and Research and Academic Advisory Committee (2008-present), Centre for Infrastructure, Sustainable Transportation, and Urban Planning, IISc.
- Member Secretary, IISc-IGCAR R & D Cell, 2011-present.
- Institute Coordinator, National Program on Earthquake Engineering Education, MHRD, Government of India, 2005-2007.
 - The Institute received a grant of Rs 1.1 crores to implement this programme. Some of the activities carried out as a part of this programme were: (a) 262 man-weeks of training of teachers from engineering colleges via short term courses in the area of earthquake engineering and allied subjects; (b) running of two editions of semester-long courses in earthquake engineering through which 14 teachers from engineering colleges were trained; (c) indigenous development of a six-axes earthquake simulator (1m×1m table, payload up to 500 kg, accelerations up to 2g over a frequency range up to 15 Hz);(d) hosting of two international visitors for short stays; (e) organization of two national level workshops in the areas of experimental methods in earthquake

engineering and tsunami hazard along Indian coast; and (f) development of a suite of 12 experimental set ups (accompanied by detailed students' and instructors' manuals) for earthquake engineering education through experiments.

- Convener, Department of Civil Engineering Recruitment Committee, 2007 to 2010.
- Convener, 1993-1995, 2000, Structural Engineering Laboratory.
- Convener, Faculty Seminar Series, Department of Civil Engineering, IISc; a series of 44 monthly seminars was arranged during the period 2007-2010.
- Member, Senate Medals Committee, 2005- present.
- Member, Senate Curriculum Committee, 2006-2010.
- Member, Selection committee for selecting officers working in Defence Research and Development Organization seeking admission to ME/MTech courses at IISc, 2004, 2010, 2012.
- Member, Senate Committee on External Registration Program, 2004-05.
- Member, Committee of Professors for Centre for Earth Sciences, 2007-present.
- Member, Senate Committee on Library matters, 2000- 2004.
- Convener of the committee that was responsible for creation of about 2400 m² of laboratory space by removal of a defunct water tunnel test facility in the department of civil engineering.
- Paper setter and examiner for GATE 2000 (Graduate Aptitude Test in Engineering)
- Paper setter and evaluator for the IISc entrance examination for admission to research, 2001.
- Coordinator, Profiscience, December 1999-July 2000

16.0 Personal Details

Birth: 11 May 1959 (Hubli, Karnataka, India); Married (two daughters).