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Prof. Amirtham Rajagopal

Curriculum Vitae

Research Interests

Damage Mechanics, Mutliscale modeling, Nonlinear Finite Element and Meshless methods, Mechanics of Composites.

Summary

- 12 years and 5 months of post Ph.D. Teaching and Research Experience.
- 2 year and 10 months of Post Doctoral Research Experience.
- 1 year and 2 months of Industry Experience.
- Average rating of Student Evaluation per course taught is 4.0/5.0.
- Author of 50+ publications in peer- reviewed reputed International Journals
- Number of M.Tech Students: Graduated: 11, Ongoing: 1
- Number of Ph.D. Students: Graduated: 5, Ongoing: 8

Education

2001-2007 **Doctor of Philosophy, Ph.D.**, *Indian Institute of Technology Madras*, Chennai, India, Thesis Title: *Mesh adaption techniques for plane and plate bending problems,* Advisor: Prof.M.S. Sivakumar, CGPA: 9.7/10.

1998-2000 **Master of Technology, M.Tech.**, *Structural Engineering, SJCE Mysore, VTU Belgaum, India.*, Thesis Title: *Crack model for concrete using nonlinear FEM*, *First Rank and University Gold Medal, First with Distinction, 86.7%*.

1993-1997 **Bachelor of Engineering, B.E.**, *Civil Engineering, MSRIT, Bangalore University, India*, *First Rank in MSRIT, Fourth Rank Bangalore University*, *Distinction, 82.2%*.

Professional Experience

09/2020- Present **Professor**, *Department of Civil Engineering, Indian Institute of Technology, Hyderabad, India.*

03/2016- 08/2020 **Associate Professor**, *Department of Civil Engineering, Indian Institute of Technology, Hyderabad, India.*

08/2010- 03/2016 **Assistant Professor**, *Department of Civil Engineering, Indian Institute of Technology, Hyderabad, India.*

10/2007- 08/2010 **Postdoctoral Researcher**, *Chair of Applied Mechanics, Friedrich-Alexander-Universität Erlangen-Nürenberg, Germany.*

06/2006- 09/2007 **Project Officer- Post Ph.D.**, *Department of Applied Mechanics, Indian Institute of Technology Madras, Chennai, India*.

06/2000- 06/2006 **Project Associate- SRF**, *Department of Civil Engineering, Indian Institute of Technology Madras, Chennai, India*.

09/1997- 06/1998 **Quality Control Engineer**, *M/S Vijay Nirman Company, Banglore, India*.

Teaching Experience

(a) **Undergraduate Courses**, *Taught at IIT Hyderabad*.

- ME2010- Mechanics of Solids
- ME1210- Engineering Mechanics
- CE2020- Construction Materials
- CE2100- Structural Analysis
- CE2101- Structural Analysis Lab
- ID1010- Concepts in Engineering Design
- CE3310- Geotechnical Engineering - I
- CE3102- Introduction to Reinforced Concrete Design
- CE3122- Reinforced Concrete Design
- ID1020- CPS Course

(b) **Graduate Courses**, *Taught at IIT Hyderabad*.

- CE6010- Advanced Structural Mechanics
- CE6010- Applied Finite Element Method
- CE6020- Finite Element Analysis
- CE6030- Elasticity and Plasticity
- ME5030- Advanced Mechanics of Solids
- CE6021- Finite Element Lab
- CE5510- Industrial Seminar Course
- Total Number of Course Credit offered from Aug. 2010 to Dec. 2019: 92
- Average value of students evaluation from Aug. 2010 to Dec. 2019: 4.0/5

Awards and Recognitions

- Excellence in Research award for Ph.D. Student at IIT Hyderabad, 2017- 2018.
- Best Research Paper Award, PHEMMA Conference, IIITDM Jabalpur, India, 2017.
- Best Research Paper Award, SES Conference, USA, 2016.
- DAAD fellowship for Ph.D. student, Bi-Nationaly supervised Doctoral degree 2016/17.
- JENESYS Exhcnage visit for Ph.D. students to Japan 2016, 2018, 2019.
- JENESYS Exchange visit fellowship for Japan 2012.
- DST Young Scientist Fellowship Award, 2012.
- First Rank and University Gold Medal in VTU, Belgaum, for M.Tech, 2001.
- SJCE Cash Prize Award for Securing First Rank in MTech, 2001.
- MHRD Scholarship for M.Tech studies, GATE 1998.
- SIR MV Memorial Prize for achieving First Rank in 3^{rd} Year B.E., Bangalore University, 1996.

- First Rank in MSRIT, Fourth Rank in BE (Civil) at Bangalore University, 1997.
- Cash Prize and Award for Excellence in Steel Structures and Soil Mechanics, Bangalore University, 1997.

Conferences, Short Courses Organized

19-21/2/2020 **NMAMLD 2020**, *Nonlocal Mechanics Approaches for Modeling Localized Deformations*, Sponsored by CSIR, DRDO and Industry.

22-27/12/2017 **ICCMS 2017**, *First International Conference on Composite Materials and Structures*, Sponsored by DST,CSIR,DRDO,DBT,DIT and Industry.

14-24/7/2016 **FEM 2016**, *GIAN course on Finite Element Method*, Sponsored by GIAN.

15-26/12/2016 **ACM 2016**, *GIAN course on Applied Continuum Mechanics*, Sponsored by GIAN.

15-25/3/2015 **AFEM 2015**, *Course on Advances in Finite Element Method*, Sponsored by TEQIP.

23-26/12/2014 **NLFEM 2014**, *Course on Nonlinear Finite Element Method*, Sponsored by DRDO.

9-12/12/2012 **ICCMS 2012**, *Fourth International Conference on Computational Mechanics and Simulation*, Sponsored by DST,CSIR, DRDO,DBT,DIT and Industry.

23- 26/12/2012 **FEM 2012**, *Short Course on Finite Element Method*, Sponsored by DRDO, Industry.

Peer-Reviewed Journal Publications

I **Journal Edited Volumes**.

1. Amirtham Rajagopal and J.N. Reddy. Special Issue of ICCMS 2017: Nonlinear analysis of Composites, *Mechanics of Advanced Materials and Structures*, 26(1), 185- 385, 2019.
2. Amirtham Rajagopal and J.N. Reddy. Special Issue of ICCMS 2017: Modeling Damage in Composites, *International Journal for Computational Methods in Engineering Science and Mechanics*, 19(6), 375- 575, 2018.
3. Amirtham Rajagopal and K.V.L. Subramaniam. Special Issue of 4^{th} ICCMS 2012: Computational Modeling of Damage and Fracture,*International Journal for Computational Methods in Engineering Science and Mechanics*, 15(3), 183-308, 2014.
4. Amirtham Rajagopal and K.V.L. Subramaniam. Special Issue of 4^{th} ICCMS 2012: Computational Methods,*Journal of Structural Engineering*, 40(1), 103-192, 2013.

II **International Journal Papers**, *With IITH Students*.

1. P. Raghu, A. Rajagopal, J.N. Reddy. Modeling of brittle fracture in thick plates subjected to transient dynamic loads using a hybrid phase field model, Meccanica, 2020. (Accepted for Publication).
2. P. Raghu, Amirtham Rajagopal, J.N. Reddy. Thermodynamically consistent variational approach for modeling brittle fracture in thick plates by a hybrid phase field model, *ASME Journal of Applied Mechanics*, 87(2), 1-40, 2020.
3. P. Raghu, Amirtham Rajagopal, J.N. Reddy. Nonlocal transient dynamic analysis of laminated Composite plates, *Mechanics of Advanced Materials and Structures*, Accepted for Publication, 2020. DOI:10.1080/15376494.2020.1718810.
4. K. Preethi, S. Bhattacharya, Amirtham Rajagopal, J.N. Reddy. Phase field modeling of fracture in quasi Brittle materials using natural neighbor Galerkin method, *Computer Methods in Applied Mechanics and Engineering*, 366, 113019, 2020.
5. K. Akshaya Gomathi, Amirtham Rajagopal, K.S.S. Reddy, B. Ramakrishna. Plasticity based material model for Concrete subjected to dynamic loading, *International*

Journal of Impact Engineering,142, 103581, 2020.

6. A. Rawat, M. Hossain, Amirtham Rajagopal. Nonlocal plasticity based damage modeling in quasi Brittle materials using Isogeometric analysis. *Engineering Computation*, Accepted for Publication, 2020.
7. S. Karthik, P.V.S.K. Kumar, Amirtham Rajagopal, J.N. Reddy. Nonlocal phase field approach for modeling damage and fracture in quasi-brittle materials, *Engineering Fracture Mechanics*, Accepted for Publication, 2020.
8. B. Balakrishnan, S. Raja, Amirtham Rajagopal. Influence of MWNT Fillers on Vibroacoustic Characteristics of Polymer Nanocomposite and Coated Aircraft Panels, *Journal of Acoustic Society of America*,2020. (Accepted for Publication).
9. B.Balakrishnan, Amirtham Rajagopal, S.Raja. Vibroacoustic Performance Assessment of Aircraft Panels InLow- Mid- High Frequency Regimes, *Mechanics of Advanced Materials and structures*, 2020. (Accepted for Publication).
10. P. Aurojyoti, P. Raghu, Amirtham Rajagopal, J.N. Reddy. An n-sided polygonal finite element for nonlocal nonlinear analysis of plates and Laminates, *International Journal for Numerical Methods in Engineering*, 120(9), 1071- 1107, 2019.
11. K. Shiva, P. Raghu, Amirtham Rajagopal, J.N. Reddy. Nonlocal buckling analysis of Laminated Composite plates considering surface stress effects, *Composite Structures*, 226, 231- 256, 2019.
12. Basant Kumar, S. Madhukar, Amirtham Rajagopal. Adaptive analysis of plates and Laminates using natural neighbour Galerkin meshless method, *Engineering with Computers*, 35(1), 201-214, 2019.
13. S. Srividhya, B. Kumar, R. K. Gupta and A. Rajagopal . Nonlocal nonlinear analysis of FGM plates using generalized higher order shear deformation theory, *International Journal of Material and Structural Integrity*, 3(2), 23-45, 2019.
14. B. Umesh, Amirtham Rajagopal. Higher order continuous approximation for assessment of nonlocal gradient damage model, *Mechanics of Advanced Materials and Structures*, 26(20),1671-1682, 2019.
15. B. Umesh, Amirtham Rajagopal, J.N. Reddy. One dimensional nonlocal integro-differential model and gradient elasticity model: Approximate solutions and size effects, *Mechanics of Advanced Materials and Structures*, 26(3), 260-273, 2019.
16. S. Srividhya, K. Basant, R.K. Gupta, Amirtham Rajagopal, J.N. Reddy. Influence of homogenization scheme on bending responses of functionally graded plates, *Acta Mechanica*, 229(10), 4071-4089, 2018.
17. S. Srividhya, P. Raghu, Amirtham Rajagopal, J.N. Reddy. Nonlocal nonlinear analysis of functionally graded plates using third-order shear deformation theory, *International Journal of Engineering Science*, 125, 1-22, 2018.
18. S. Srividhya, B. Kumar, R.K. Gupta and Amirtham Rajagopal. Nonlocal nonlinear analysis of moderately thick functionally graded plates subjected to transverse loads, *Journal of Aerospace Science and Technology*, 70(2), 990-1015, 2018.
19. P. Raghu, Amirtham Rajagopal, J.N. Reddy. Nonlocal nonlinear finite element analysis of composite plates using TSDT. *Composite Structures*, 185, 38-50, 2018.
20. K. Preethi, P. Raghu, Amirtham Rajagopal, J.N. Reddy. Nonlocal nonlinear bending and free vibration analysis of a rotating laminated nano cantilever beam, *Mechanics of Advanced Materials and Structures*, 25(5), 439-450, 2018.
21. S.S. Singh, D.K. Nair, A. Rajagopal, P. Pal, A.K. Pandey. Dynamic analysis of micro beams based on modified strain gradient theory using differential quadrature method, *European Journal of Computational Mechanics*, 27(3), 187-203, 2018.
22. A. Rajagopal, M. Kraus, P. Steinmann. Hyperelastic analysis based on a polygonal finite element method, *Mechanics of Advanced Materials and Structures*, 25(11),

930-942, 2018.

23. M. Chellapandian, S. Suriyaprakash, Amirtham Rajagopal. Analytical and Finite Element Studies on Hybrid FRP Strengthened RC Column elements under axial and eccentric compression, *Composite Structures*, 184(1), 234-248, 2018.
24. K. Balaji, Amirtham Rajagopal, P.Steinmann. Adaptive polygonal finite element for analysis for plane elasticity problems, *International Journal for Computational Methods in Engineering Science and Mechanics*, 18(2-3), 146-165, 2017.
25. P. Raghu, K. Preethi, Amirtham Rajagopal, J.N. Reddy. Nonlocal third order shear deformation theory for analysis of Composite plates considering surface stress effects, *Composite Structures*, 139(1), 13-29, 2016.
26. K. Preethi, Amirtham Rajagopal, J.N. Reddy. Surface and nonlocal effects for nonlinear analysis of Timoshenko beams, *International Journal for Nonlinear Mechanics*, 76, 100-111, 2015.
27. S. Madhukar, A. Rajagopal. Meshless natural neighbor Galerkin method for the bending and vibration analysis of composite plates, *Composite Structures*, 111, 138-146, 2014.
28. N. Kumar, M. Pandey, Amirtham Rajagopal. Plasticity based approach for failure modeling of unreinforced masonry, *Engineering Structures*, 80, 40-52, 2014.
29. B. Umesh, Amirtham Rajagopal, J.N. Reddy. An $r-h$ adaptive strategy for Isogeometric analysis, *International Journal for Computational Methods in Engineering Science and Mechanics*, 17(2), 73-92, 2016.
30. B. Balakrishnan, S. Raja, D. Dwarkanathan, Amirtham Rajagopal. Vibroacoustic performance of fiber metal laminates with delamination, *Mechanics of Advanced Materials and Structures*, 23(12), 1369-1378, 2016.
31. N. Kumar, L. Harish, M. Pandey, Amirtham Rajagopal. Homogenization of periodic Masonry using Self Consistent Scheme and Finite Element Method, *Mechanics of Advanced Materials and Structures*, 17(1), 7-21, 2016.
32. K.Santosh, A. Rajagopal. A strain gradient plasticity model for modeling damage in Quasi brittle materials. *Journal of Structural Engineering*, 43(6), 1-22, 2016.
33. N. Kumar, M. Pandey, Amirtham Rajagopal. A rate independent cohesive zone model for modeling failure in quasi brittle materials, *Mechanics of Advanced Materials and Structures*, 22(8), 681-696, 2015.
34. S. Madhukar, Amirtham Rajagopal. Meshless natural element method for nonlinear analysis of composite plates, *Journal of Structural Engineering*, 42(1), 57-63, 2015.
35. M.K. Pal, A.Rajagopal. Sensitivity analysis of linear elastic cracked structures using generalized finite element method, *International Journal for Computational Methods in Engineering Science and Mechanics*, 15(5), 422-437, 2014.
36. Amirtham Rajagopal, M.Kraus, P. Steinmann. Investigations on the polygonal finite element method: Constrained adaptive Delaunay Tessellation and Conformal Interpolants, *Computers and Structures*, 120, 33-46, 2013.
37. N. Kumar, Amirtham Rajagopal. Masonry failure analysis using a composite interface model, *Journal of Structural Engineering*, 40(1), 35-43, 2013.
38. Amirtham Rajagopal, P. Fischer, P. Steinmann, E. Kuhl. Natural element analysis of Cahn-Hilliard phase field modeling, *Computational Mechanics*, 46(3),471-493, 2010.
39. Amirtham Rajagopal, P. Fischer, E. Kuhl, P. Steinmann. Cahn Hilliard Generalized diffusion modeling using Natural element method, *Mechanics of Generalized Continua*, 7, 325-337, 2011.
40. B. Umesh, A. Rajagopal. Modeling of CFRP strengthened RCC beam using the nonlinear finite element method, *Journal of Structural Engineering*, 40(2), 169–184,

2013.

III **International Journal Papers**, *With IITH Students - Articles under Review*.

1. P.V.S.K. Kumar, Manoj Pandey, Amirtham Rajagopal. Plasticity based Interface model for Unreinforced Masonry subjected to cyclic loading, *Engineering Structures*, 2020. (Submitted, Under Review).

IV **International Journal Papers**, *Before Joining IITH* .

1. G. Balachandran, Amirtham Rajagopal, S.M. Sivakumar . Mesh free Galerkin method based on natural neighbours and conformal mapping, *Computational Mechanics*, 42(6), 885-905, 2008.
2. Amirtham Rajagopal, S.M. Sivakumar. An r-h adaptive strategy for analysis of plane problems with bimaterial interfaces, *Computational Mechanics*, 41(1), 49-72, 2007.
3. Amirtham Rajagopal, S.M. Sivakumar. Energy based adaptive strategy for plates and laminates, *International Journal for Computational Methods in Engineering Science and Mechanics*, 10(3), 209-223, 2009.
4. Amirtham Rajagopal, M. Scherer, P. Steinmann, N. Sukumar. Smooth conformal alpha NEM for gradient elasticity, *International Journal for Structural Changes in Solids – Mechanics and Applications*, 1(1), 83-109, 2009.
5. Amirtham Rajagopal, P. Steinmann. Towards analysis of materials with strain gradient effects using natural element method, *Proc. Applied Mechanics and Mathematics*, 8(1), 10255-10267, 2008.
6. Amirtham Rajagopal, S.M. Sivakumar. Optimality of finite element grids based on material forces and error assessment, *Computer Assisted Mechanics and Engineering Sciences*, 13(2), 247-268, 2006.
7. Amirtham Rajagopal, G. Raju, S.M. Sivakumar. Performance evaluation of configurational force and spring analogy based mesh optimization schemes, *International journal for Computational Methods in Engineering Science and Mechanics*, 7(4), 241-262, 2006.
8. Amirtham Rajagopal, G. Raju, S.M. Sivakumar. An r-h adaptive strategy based material forces and error assessment, *Journal of Computers Materials and Continua*, 1(3), 229-244, 2004.
9. Amirtham Rajagopal, M. Ravichandran, G. Muralidharan, S.M. Sivakumar. Structural integrity assessment of LMFBR components using a Distributed computing environment, *International Journal for Fatigue and Fracture of Engineering Materials and Structures*, 26, 847-858, 2004.
10. M.K. Pal, A. Rajagopal. Multiscale failure modeling of composites using Generalized finite element method, *Applied Mechanics and Mathematics*, 12(1), 453-455, 2012.

V **International Journal Papers**, *With External Project Collaboration*.

1. A.A. Nasedkina, A. Rajagopal. Finite element homogenization of periodic block Masonry by the effective moduli method. *Advanced Materials*, 193, 347-359, 2017.
2. P. Raghu, Anna A. Nasedkina, Andrey V. Nasedkin, Amirtham Rajagopal and B. Saswata. Nonlocal analysis of Composite lamainates,*Advanced Materials*, 207, 307-315, 2018.
3. K.S.S. Reddy, A.A. Nasedkina, A.V. Nasedkin, B. Saswata, Amirtham Rajagopal. Comparative study on progressive damage models for composites,*Advanced Materials*, 207, 413-427, 2018.
4. A.A. Nasedkina, Amirtham Rajagopal. Mathematical and computer homogenization models for bulk mixture composite materials with imperfect interfaces. *Materials*

Physics and Mechanics, 37, 34-41, 2018.

5. A.V. Nasedkin, A.A. Nasedkina, Rajagopal Amirtham. Finite Element Analysis of Cymbal Transducer from Porous Piezoceramics PZT-4 with Various Material Properties, *Advanced Materials*, 207, 533-547, 2017.
6. A.V. Nasedkin, A.A. Nasedkina, Rajagopal Amirtham. Finite element simulation of thermoelastic effective properties of periodic Masonry with porous bricks. In: Sumbatyan M. (eds) Wave Dynamics and Composite Mechanics for Microstructured Materials and Metamaterials. *Advanced Structured Materials*, 59, 205-220, 2017.
7. A.V. Nasedkin, A.A. Nasedkina, A. Rajagopal, V.V. Remizov. Some finite element approaches for modeling of anisotropic thermoelastic mixture and periodic composites with internal microstructure, *Proceedings of the 8th GRACM International Congress on Computational Mechanics*, 12-15 July 2015, Volos, Greece. N. Pelekasis and G. Stavroulakis, (Editors). University of Thessaly, 2015.

VI **Refereed Conference Proceedings**, *With IITH Students*.

1. Angel Rawat, Amirtham Rajagopal. Nonlocal finite strain damage model for Hyperelastic materials, *In proceedings of Ninth International Conference on Engineering Failure Analysis*, Shanghai, China, 2020.
2. Karthik S and Amirtham Rajagopal, On the finite strain extension of a strain gradient damage model, *In proceedings of WCCM-ECCOMAS*, Paris, France, 2020.
3. Angel Rawat, Amirtham Rajagopal. Nonlocal damage plasticity model for Quasi-Brittle materials using B-Spline.*In proceedings of 10th International Conference on Materials for Advanced Technologies*, Marina Bay Sands, Singapore, 2019.
4. K.S.S. Reddy, Amirtham Rajagopal. Phase field implementation of quasi-static and dynamic brittle fracture, *proceedings of WCCM-ECCOMAS*,Paris, France. 2020
5. K.S.S. Reddy, Amirtham Rajagopal. Effect of damage modes and fiber volume fraction on the effective properties of the Unidirectional composites. *Proceedings of ISTAM*, VIT Vellore, India. 2016.
6. Aurojyoti Prusty, Amirtham Rajagopal. Polygonal FEM for nonlocal analysis of plates and laminates, *Proceedings of ICCMS*, IIT Mandi, 2019.
7. Aurojyoti Prusty, Amirtham Rajagopal. Crack propagation in bimaterial interface using cohesive zone model. *Proceedings of WCCM-ECCOMAS*, Paris, France, 2020.
8. P. Kasirajan, F. Aldakheel, M. A. Keip, A. Rajagopal. A phase field approach for modeling damage using natural neighbor Galerkin Method. *5th International Conference on Computational Modeling of Fracture and Failure in Materials and Structures*, Nantes, France, 2017.
9. P. Kasirajan, S. Bhattacharya, A. Rajagopal. A phase field approach to damage modeling in Composites using natural neighbor Galerkin method. *4th International Conference on Mechanics of Composites*, Madrid, Spain, 2018.
10. A. Rajagopal, P. Raghu. Towards nonlocal approaches for modeling damage in quasi brittle materials. *Proceedings of 7th ICCMS*, IIT Mandi, India, 2019.
11. K. Shiva Reddy, Amirtham Rajagopal. Buckling analysis of laminated composite plates considering Nonlocal and Surface stress effects. Proceedings of 7th ICCMS, IIT Mandi, India, 2019.
12. S. Karthik, Amirtham Rajagopal. A nonlocal phase field approach for modeling damage,*In proceedings of SES*, Washington University in St. Louis, USA. 2019.
13. S. Karthik, Amirtham Rajagopal. A nonlocal phase field approach for modeling fracture, *In proceedings of SIPS*, Phuket, Thailand, 2020.
14. K. Akshaya Gomathi and Amirtham Rajagopal. Numerical damage modeling of RC slabs under blast loading using K&C concrete model, *Proceedings of 7th ICCMS*,

IIT Mandi, India, 2019.

15. Angel Rawat, Amirtham Rajagopal. Nonlocal gradient damage model for Quasi-Brittle materials and Composites, *proceedings of International Conference on Composite Materials and Structures*, Hyderabad, 2017.
16. P. Raghu, A.Nasedkina, A. Nasedkin, B. Saswata, A. Rajagopal. Nonlocal nonlinear analysis of Composites. *Proceedings of International Conference on Physics and Mechanics of new materials and their applications*, IIITDM Jabalpur, India, 2017.
17. D. Sharma, P. Raghu, Amirtham Rajagopal. A Novel n-sided polygonal finite element approach for analysis of Isotropic plates. *Proceedings of International Conference on Physics and Mechanics of new materials and their applications*, IIITDM Jabalpur, India, 2017.
18. P. Raghu and A. Rajagopal. Nonlinear finite element analysis of laminated composite plates using nonlocal third-order shear deformation theory. *Proceedings of International Conference on Composite Structures*, Paris, France, 2017.
19. P. Raghu, A. Rajagopal. Nonlocal analysis of laminated plates using third order shear deformation theory considering surface stress effects. *Proceedings of 6th ICCMS*, IIT Bombay, Mumbai, India, 2016.
20. P. Raghu and A. Rajagopal. Poly FEM for plane elasticity problems. *proceedings of ISTAM Conference*, VIT, Vellore, India, 2014.
21. Raghu Piska, Amirtham Rajagopal, Nonlocal TSDT for analysis of laminated plates considering surface effects, *Proceedings of the 3rd International Conference on Modeling and Simulation in Civil Engineering*, GCE Trivandrum, India, 2015.
22. P. Kasirajan, A. Rajagopal. Meshfree natural neighbour galerkin method for nonlinear analysis of composite plates, *Proceedings of the 18th International Congress on Composites*, Lisbon, Portugal, 2015.
23. Amirtham Rajagopal, Paul Steinmann. Applications of Meshless natural neighbour Galerkin Methods, *Proceedings of eXtended Discretization MethodS* , XDMS 2015, Ferrari, Italy, 2015.
24. B. Umesh, Amirtham Rajagopal. An adaptive studies in IsoGeometric Analysis for solving plane problems.,*Proceedings of eXtended Discretization MethodS* , XDMS 2015, Ferrari, Italy, 2015.
25. K.B. Amit, S. Naik, Amirtham Rajagopal, A. Mohan. Simulation of blood flow in the stenosed left coronary artery,*Proceedings of ICCSET 2014*, 7-8 March SVCE Chennai, India, 2014.
26. P. Kasirajan and Amirtham Rajagopal. Nonlocal nonlinear finite element formulations for analysis of beams considering surface effects, *Proceedings of the 5th International Congress on Computational Mechanics and Simulation*, SERC Chennai, India, 2014.
27. B. Kumar and Amirtham Rajagopal. Mesh free reproducing kernel particle methods for the analysis of FGMS, *Proceedings of the 5th International Congress on Computational Mechanics and Simulation*, SERC Chennai, India, 2014.
28. B. Kumar, Singam Srividhya and Amirtham Rajagopal. Nonlinear analysis of FGM plates using TSDT and Natural Neighbour Galerkin Method, *Proceedings of 4th International conference on Mechanics of Composites*, Madrid, Spain, 9-12 July 2018.
29. Amirtham Rajagopal, P. Kasirajan, J.N. Reddy. Phase field approach to modeling fracture, *Prager Symposium- Proceedings of SES Conference*, University of Maryland, College Park, Baltimore, USA. 2016.
30. S. Srividhya, B. Kumar, R. K. Gupta, A. Rajagopal. Meshless natural neighbour Galerkin method for the analysis of composite plates using higher order shear

deformation theories, *Proceedings of 61st Congress of Indian Society of Theoretical and Applied Mechanics*, VIT, Vellore, India, 2016.

31. S. Srividhya, B. Kumar, R. K. Gupta, A. Rajagopal. Nonlinear analysis of FGM plates using Generalized Higher Order Shear Deformation Theory, *Proceedings of Indian Conference on Applied Mechanics*, MNNIT Allahabad, 2017.
32. S. Madukar, Amirtham Rajagopal. Meshless natural neighbor Galerkin method for nonlinear analysis of laminated composite plates, *Proceedings of the 5th International Congress on Computational Mechanics and Simulation*, SERC Chennai, India, 2014.
33. V.S. Nikhil, N.K. Prashant, Amirtham Rajagopal, and Ashok Pandey. Nonlocal and surface effects on resonance frequencies of nano beams, *Proceedings of the International Conference on MEMS and Sensors*, ICMEMSS, IIT Madras, Chennai, India, 2014.
34. Raghu Piska and Amirtham Rajagopal. Analytical solutions for Laminated composite plates considering nonlocal and shear deformation effects, *Proceedings of 5th International Congress on Computational Mechanics and Simulation*, SERC Chennai, India, 2014.
35. B. Umesh, Amirtham Rajagopal. Paramterization in Isogeometric analysis, *Proceedings of Asia Pacific Congress on Computational Mechanics*, APCOM 2013, Singapore, 2013.
36. S. Polamuri and A. Rajagopal. Nonlinear Finite Element Analysis of FRP Strengthened RCC beam subjected to Fire, *Proceedings of Indian conference on Applied Mechanics*, INCAM 2013, IIT Madras, India, 2103.
37. K. Rashmi and A. Rajagopal. Generalized shear deformation theory for the analysis of composite plates, *Proceedings of Indian Conference on Applied Mechanics*, INCAM 2013, IIT Madras, India, 2103.
38. H. Prodduturu and Amirtham Rajagopal. Nonlocal nonlinear formulations for the analysis of laminated composite plates, *Proceedings of Indian Conference on Applied Mechanics*, INCAM 2013, IIT Madras, India, 2013.
39. B. Umesh, A. Rajagopal. Higher order natural element analysis of Cahn- Hilliard phase field model for strongly anisotrpic systems., *Proceedings of World Congress on Computational Mechanics*, WCCM 2012, 8-13 July 2012, Sao Paulo, Brazil. 2012.
40. Nitin Kumar and A. Rajagopal. Plasticity based composite interface model for failure modeling of masonry., *Proceedings of International Conference on Computational Mechanics and Simulation* , ICCMS 2012, 9-12 December 2012, Hyderabad, India, 2012.
41. M.Somireddy and Amirtham Rajagopal. Adaptive natural neighbour Galerkin method for the analysis of plates and laminates, *Proceedings of International Conference on Computational Mechanics and Simulation*, ICCMS 2012, 9-12 December 2012, Hyderabad, India, 2012.
42. Mahendra Kumar Pal and Amirtham Rajagopal. Generalized finite element method for fracture analysis,*Proceedings of International Conference on Computational Mechanics and Simulation*, ICCMS 2012, 9-12 December 2012, Hyderabad, India, 2012.
43. M.K. Pal and A. Rajagopal. Multiscale failure modeling of composites using generalized finite element method,*Proceedings of GAMM Conference*, 26-30 March 2012, TU Darmstad, Germany, 2012.
44. L. Harish and A. Rajagopal. Multiscale failure modeling of composite laminates, *Proceedings of XVII National seminar on Aerospace structures*, IIT Kanpur, 22-23 September, India, 2011.

45. A. Rajagopal, Markus Kraus, Paul Fischer, Paul Steinmann, Hyperelastic analysis using adaptive Delaunay tessellation, *Proceedings of ICTACEM*, IIT Khargpur, 24-27 December, India, 2010.

VII **Refereed Conference Proceedings**, *Before joining IITH*.

1. Amirtham Rajagopal, Paul Fischer, Paul Steinmann, Ellen Kuhl . C^1 Natural element method for the analysis of Cahn-Hilliard phase field model,*Proceedings of GAMM Conference*, TU Stuttgart, Germany, 2009.
2. Amirtham Rajagopal, Paul Fischer, Paul Steinmann, Ellen Kuhl. C^1 Natural element method for the analysis of Cahn-Hilliard phase field model, *Proceedings of GAMM Conference*, TU Bremen, Germany, 2008.
3. A. Rajagopal, and S.M. Sivakumar. An r-h refinement strategy for analysis of RM Plates , In Maity et al (eds): *Proceedings of 2nd International Conference on Computational Mechanics*, IIT Guwahati, India, 2006.
4. A. Rajagopal, Govindaswamy N Muralidher, Srinivasan M Sivakumar. A Damage Assessment Model for Components subjected to thermal stripping, *Proceedings of XIV NASAS*, VNIT, Nagpur, 2006.
5. Amirtham Rajagopal, and Srinivasan M Sivakumar. An r-h Adaptive Strategy for Stress Analysis of Composites, in Sivakumar M. S. et al (eds)*Proceedings of the International Conference on Computational and Experimental Engineering and Sciences*, ICCES '05, Dec.1-6, 2005. India, 142-3147, 2005.
6. A. Rajagopal, G. Raju, S.M. Sivakumar. Energy based a-posteriori error estimation and adaptive finite element analysis of laminated composite plates, in G R Liu et al. (eds) Computational Methods: *Proceedings of First International Conference on Computational Methods,* Singapore (2004). Springer:Dordrecht, pp1456-1460, ISBN: 978-1-4020-3952-2, 2006.

Sponsored Projects

Total value of Projects Completed and Ongoing: Rs. 2.48 crores

Number of Sponsored Projects Completed: 7

Number of Projects Ongoing: 5

2010-2012 **IITH- Seed grant**, *Adaptive FE analysis of Composites*, Rs. 5 Lakhs, Role: PI.

2011-2012 **AR&DB-DRDO**, *Adaptive IGA of Composite Plates*, Rs. 6.83 Lakhs, Role: PI.

2012-2013 **DST-FastTrack**, *Multiscale modeling of materials*, Rs. 8.38 Lakhs, Role: PI.

2012-2013 **DBT**, *Damage Modeling of Arteries with Plaques*, Rs. 45 Lakhs, Role: Co- PI.

2013-2014 **AR&DB-DRDO**, *Damage model for Composites*, Rs.17.93 Lakhs, Role: PI.

2015-2016 **DRDO-CARS**, *Bending and free vibration of FGM plates*, Rs.9.84 Lakhs.

2017-2018 **DST-RFBR**, *Computational modeling of adaptive microporus materials*, Rs.32.28 Lakhs, Role: PI, Indo-Russian, Bilateral Scheme..

2017-2018 **DRDO-CARS**, *Modeling damage in FGMs by a nonlocal approach*, Rs.9.94 Lakhs.

2018-2019 **ISRO**, *Nonlocal damage models for motor casing*, Rs.21.2 Lakhs.

2018-2019 **ARMREB-DRDO**, *Nonlocal damage models for materials*, 30.6 Lakhs, Role: PI.

2019-2020 **CSIR**, *Poly-FEM for nonlocal analysis of plates*, 15.45 Lakhs, Role: PI.

2020-2021 **DRDO-CARS**, *Nonlocal PD damage model*, Rs.9.97 Lakhs, Role: PI, .

2020-2022 **DST-JSPS**, *Nonlocal plasticity based damage models for concrete*, Rs.35.78 Lakhs, Role: PI, Indo-Japan, Bilateral Scheme..

Student Guidance

(a) **Ph.D. Students**.

Number of Ph.D. Students Graduated : 5.

Number of Ph.D. Students Ongoing work : 8.

2012-2016 **Dr.Umesh Bassappa**, *Nonlocal gradient damage approach using IGA, Date of Ph.D. Defense: 18th November 2016.*, Currently:Assistant Professor, NIT Warangal, Role: Guide.

2014-2019 **Dr.Basant Kumar**, *Nonlocal nonlinear analysis of FGM plates in a thermo-structural environment, Date of Ph.D. Defense: 18th November 2019.*, Currently: Scientist E, ASL, DRDO, Role: Guide.

2016-2019 **Dr.Raghu Piska**, *Nonlocal nonlinear approaches for modeling damage in structures, Date of Ph.D Defense 18th Feb 2020.*, Currently: Institute Post-Doc, IIT Hyderabad, Role:Guide.

2013-2020 **Dr.Preethi Kasirajan**, *Nonlocal Phase field approach to modeling Fracture, Date of Ph.D. Defense: 5th March 2020* , Currently:Project Associate, IIT Hyderbad, Role: Guide.

2012-2020 **B. Balakrishnan**, *Vibroacoustic analysis of FML*, Currently: Scientist E, NAL Bangalore, OC Completed, Thesis Review Completed, Viva Scheduled in Second Week of Sept..

2017-Present **S. Karthick**, *Phase field approach to modeling damage*, (Completed Proposal Exam).

2017-Present **P.V. Kumar**, *Damage models for concrete*, (Completed Proposal Exam).

2017-Present **S.S. Shekar**, *Nonlocal modeling of dynamic Fracture*, (Completed Proposal Exam).

2018-Present **P. Aurojyoti**, *Modeling interfaces using a nonlocal approach*.

2019-Present **K. Shivareddy**, *Phase field approaches for modeling Fracture*.

2019-Present **D. Pranavi**, *Phase field approaches for modeling Interfaces*.

2019-Present **K. Divya**, *Microplane models for Concrete*, External Student.

(b) **M.Tech. Students**.

2010-2012 **Dr. M.K. Pal**, *GFEM for fracture analysis*, Currently:Post-Doc, E- Defense, Japan.

2010-2012 **Dr.L. Harish**, *Homogenization of Masonry*, Currently: R&D Engineer, DGMat.

2011-2013 **K. Nitin**, *Masonry Composite Interface Model*, Currently: Ph.D. Student, U.C. Davis.

2011-2013 **K. Balaji**, *Adaptive Poly- FEM*, Currently: Entrepreneur.

2013-2015 **T.K. Amar**, *IGA for plasticity*, Currently: Independent Researcher.

2013-2015 **K. Sravani**, *IGA for plasticity*, Currently: Asst. Engr. PWD, Telangana..

2015-2017 **S. Srividya**, *Meshless analysis of FGMs*, Currently: R&D Engineer. Siemens Technologies, Bangalore..

2015-2017 **A. Vadamani**, *Fire Effects in Concrete*, Independent Researcher.

2016-2018 **K. Manoj**, *Cyclic Behavior of Masonry*, Currently: Design Engineer..

2017-2019 **G. Akash**, *Peridynamic analysis of beams*, Currently: Design Engineer, L&T..

2019- Present **G.Akshaya**, *Analysis of structures subjected to extreme loads*.

Technical and Professional Activities

- Guest Editor, Annals of Solid and Structural Mechanics, Special Issue in the Honor of Prof J.N. Reddy 75^{th} Birthday, 2020.
- Guest Editor, Intl. Jl. of CMESM, Special Issue for ICCMS 2017, 2018.
- Guest Editor, Intl. Jl. of MAMS, Special Issue for ICCMS 2017, 2018.
- Guest Editor, Intl. Jl. of CMESM, Special Issue for ICCMS 2012, 2015.
- Guest Editor, Jl. of Structural Engg, Special Issue for ICCMS 2012, 2015.
- External Examiner, Ph.D. Thesis IISc, IIT Madras, IIT Roorkee, JNTU, NIT Rourkela, NIT Trichy, Annauniversity
- Reviewer for the following refereed International Journal Articles 2007 - Present.
- International Journal for Nonlinear Mechanics
- Mechanics of Advanced Materials and Structures
- Computational Mechanics
- ASME Journal of Applied Mechanics
- International Journal for Fracture
- Computer Methods in Applied Mechanics and Engineering
- European Journal of Computational Mechanics - A/ Solids
- Journal of Applied Physics
- International Journal for Solids and Structures
- Engineering Computations
- Advanced Mechanics of Materials and Structures
- Intl. Jl. for Computational Methods in Engineering Science and Mechanics

Professional Membership

- Member - International Association of Computational Mechanics 2008 - Present
- Member - Indian Society for Applied Mechanics 2010 - Present
- Member - Indian Society for Theoretical and Applied Mechanics 2010- Present
- Member - Indian Association of Computational Mechanics 2008 - Present

Institute/Departmental Responsibilities

- Convener, Departmental Postgraduate Committee, DPGC, 2010-2011.
- Convener - Printing and Publication Committee NatFOE 2011.
- Member - CDC, Structural review of contractors, 2010- 2012.

- Developed CAE lab, 2010-2011.
- Incharge - Outreach Committee, Green Office, IIT Hyderabad, 2011-2012.
- Developed Advanced Structural Mechanics Lab, 2011.
- Developed Structural Analysis Teaching Lab, 2012-2013
- Seminar Coordinator, Department of Civil Engineering, IITH, 2010-2013.
- Annual Report Coordinator, Department of Civil Engineering, IITH, 2010-2015.
- Member, Departmental Postgraduate Committee, DPGC ,2010-2016.
- Convener - Desktop Committee, ISAC, 2010-2016.
- Convener - Transportation Committee- Orientation Day, 2015-2019.
- Warden and Hostel Incharge, IIT Bhilai, 2016-2017.
- Convener, Departmental Postgraduate Committee, DPGC, 2019-Present.
- Member of Academic Senate Council, 2016- Present
- Member commitee for selection of Junior Technician- Civil
- Member commitee for selection of Senior Technician- Civil
- Organizing Secretary - International Conference ICCMS 2012, ICCMS 2017
- Organizing Secretary - Short Courses FEM 2012, NLFEM 2014, NMALD 2020
- Organizing Secretary - GIAN course on FEM 2016, Continuum Mechanics 2016.

Personal Information

- Date of Birth: 27-06-1976
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References

1. **Prof. Srinivasan M. Sivakumar**,
   Department of Applied Mechanics,
   Indian Institute of Technology, Madras,
   Chennai 600036.
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2. **Prof. Dr. -Ing. Habil. Paul Steinmann**,
   Chair of Applied Mechanics,
   Department of Mechanical Engineering,
   University of Erlangen at Nurenberg,
   Germany. D91058,
   Phone: (0049) 9131 8528503.
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3. **Prof. J. N. Reddy**,
   Oscar S. Wyatt Endowed Chair in Mechanical Engineering,
   Department of Mechanical Engineering,
   Texas A&M University,
   College Station, TX 77843-3123 USA.
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