

# Rajib Chowdhury

## Personal Details

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Homepage Department Computational Mechanics

## Education

8/2004-7/2008 Ph.D. (Structural Engineering)  
Indian Institute of Technology Madras, India  
Thesis: *High dimensional model representation for structural reliability analysis.*  
Thesis Supervisor: Prof. B Nageswara Rao and Prof. A. Meher Prasad

8/2001-3/2003 Master of Engineering (Applied Mechanics)  
Bengal Engineering and Science University, India  
Thesis: *A study on cyclic hysteretic behaviour of RC structural element.*  
Thesis Supervisor: Prof. S. C. Dutta

8/1997-7/2001 Bachelor of Engineering (Civil Engineering)  
University of North Bengal, India.

## Employment

12/2018–Present Associate Professor, Indian Institute of Technology Roorkee.  
7/2012–12/2018 Assistant Professor, Indian Institute of Technology Roorkee.  
7/2011–6/2012 Lecturer, Materials Research Centre, Swansea University.  
7/2009–6/2011 Newton Fellow, Swansea University.  
11/2008–6/2009 Research Assistant, Swansea University.  
3/2004–11/2008 Project Assistant/Project Officer, Indian Institute of Technology Madras, India.

## Awards & Honors

07/2019 Institute Research Fellowship.  
08/2015 Newton International Fellowship Alumni award (awarded £6,000).  
08/2012 Newton International Fellowship Alumni award (awarded £5,000).  
04/2011 Outstanding Paper Award at the Literati Network Awards for Excellence 2011.  
11/2008 Awarded the Newton International Fellowship (awarded £100,800) from the Royal Society and Royal Academy of Engineering, UK.  
7/2005 Selected in Student Paper Competition at ASME-PVP 2005 Conference, USA.  
8/2001 Institute Post-Graduate Fellowship.

## Teaching Activities

Solid Mechanics; Design of Steel Elements; Structural Analysis-I; Finite Element Analysis; Nanoscale Modelling and Simulation; Computer Graphics; Building Materials, Construction and Estimation; Numerical Methods and Statistics.

## Research Activities

Areas of Research

1. Computational Mechanics.
2. Uncertainty Quantification.
3. Computational Material Science.

Research Publications Publications include 2 IPOs (filed), 7 book chapters, 103 peer-reviewed international journal papers, 39 conference papers, and 4 non-refereed publications (details are in the Appendix). Based on ISI Web of Science (Researcher ID: A-2976-2009; Orcid ID: 0000-0001-9026-8657) so far, the H-index is 31.

## Student Supervision

- M.Tech.
1. Mehul Bagaria [2020-2022], Title: *Nano-topology optimization of photonic metamaterial* .
  2. Abhinandan Sharma [2020-2022], Title: *Probabilistic Fracture Simulation of Materials*.
  3. Amit Kumar [2020-2022], Title: *Mechanics of Hydrogels*.
  4. Gaurav Agrawal [2019-2021], Title: *Topology Optimization in FENICS*.
  5. Prashoon Gupta [2017-2019], Title: *NURBS based Isogeometric Analysis*.
  6. Utkarsh Rawat [2017-2019], Title: *Coupled Molecular Dynamics Phase Field Approach for Fracture Analysis*.
  7. Shantanu Singh [2016-2018], Title: *Woven Composites: An Analytical Approach*.
  8. Divyansh Singh [2016-2017], Title: *Studies on Engineered Cementitious Composites*.
  9. Umesh Kumar Mourya [2014-2016], Title: *Finite Element Model Updating of Tension Leg Platform*.
  10. Singh Bhavesh C. [2014-2016], Title: *Structural Optimization of Offshore Jacket Platform*.
  11. Abhishek Agarwal [2014-2016], Title: *Semiconducting Nanostructures for Piezoelectric Application*.
  12. Pruthivk B M [2014-2016], Title: *Finite Element Analysis of BWR And PHWR Containment Structure Subjected to Aircraft Crash*. (Co-supervised with Dr. M. A. Iqbal, Civil Engineering)
  13. Ranjeet D.Ramteke [2013-2015], Title: *Mechanical properties of nano-silica based high performance concrete*. (Co-supervised with Dr. U. K. Sharma, Civil Engineering)
  14. Nidhi Pal [2013-2015], Title: *Processing and Characterisation of Semiconducting Nanostructures*. (Co-supervised with Prof. R. Jayaganathan, Centre of Nanotechnology, IITR)
  15. Vaibhab Jain [2012-2014], Title: *Study of Mechanical and Corrosion Properties of UFG Zirconium Alloys: Experiment and Simulation*. (Co-supervised with Prof. R. Jayaganathan, Materials and Metallurgical Engineering, IITR) [Presently at Tata Steel.]
  16. Rohit Raju Madke [2012-2014], Title: *Multiscale Analysis of Cementitious Composites*.
  17. Prabir Mondal [2012-2014], Title: *Deformation Mechanism of Calcium Silicate Hydrate(C-S-H)*.
  18. Tanmoy Mukhopadhyay [2011-2013], Title: *Damage Detection of Structures using Response Surface Methodology*. (Co-supervised with Dr. A. Chakrabarti, Civil Engineering, IITR) [Presently, Assistant Professor at Department of Aerospace Engineering, IIT Kanpur.]
  19. J.V.N.R. Sarma [2011-2013], Title: *Simulation and Experimental Study of Functional Properties of Semiconductor Nanostructures*. (Co-supervised with Prof. R. Jayaganathan, Centre of Nanotechnology, IITR) [Presently at CEERI Pilani.]

- Ph.D
1. Ajendra Singh [2022-Ongoing], *Topic: Data-driven Modelling*. (Under MHRD Programme)
  2. Vaibhab Kumar [2021-Ongoing], *Topic: Composites*. (Under MHRD Programme) (Co-supervising with Prof. A. Chakraborti, Civil Engineering, IITR)
  3. Radha Yadav [2021-Ongoing], *Topic: Electromagnetic Metamaterials*. (Under MHRD Programme at CoN)
  4. Anurag Gupta [2021-Ongoing], *Topic: Dynamic Topology Optimization*. (Under DRDL CARS Project)
  5. Philip Luke K [2020-Ongoing], *Topic: Traumatic Brain Injury*. (Under SERB Project)
  6. Shubham Saurav [2020-Ongoing], *Topic: Topology Optimization for Multiphysics Problem*. (Under DRDL CARS Project)
  7. Atul Raj Singh [2020-Ongoing], *Topic: Vibro-Acoustic Metamaterials*. (Under MHRD Programme)
  8. Abhishek Kumar [2020-Ongoing], *Topic: Micro-mechanics*. (Under MHRD Programme) (Co-supervising with Prof. A. Chakraborti, Civil Engineering, IITR)
  9. U. Meenu Krishnan [2018-Ongoing], *Topic: Phase-field fracture*. (Under MHRD Programme)
  10. Praveen Verma [2018-Ongoing], *Topic: Graphene Reinforced Concrete*. (Under MHRD Programme) (Co-supervising with Prof. A. Chakraborti, Civil Engineering, IITR)
  11. Ananya Vijaya [2018-Ongoing], *Topic: Multiscale Mechanics of Architected Materials*. (Under MHRD Programme) (Co-supervising with Prof. S. Roy Chowdhury, Civil Engineering, IITR)
  12. Abhinav Gupta [2017-Ongoing], *Topic: Isogeometric Topology Optimization*. (Under MHRD Programme) (Co-supervising with Prof. A. Chakraborti, Civil Engineering, IITR)
  13. Arya Prakash Padhi [2017-Ongoing], *Topic: Refined Topology Optimization Schemes for Structural Analysis and Design*. (Co-supervising with Prof. A. Chakraborti, Civil Engineering, IITR)
  14. Rohit Raju Madke [2015-2022], *Topic: Multiscale Modelling and Failure Prediction of Woven and Braided Composites*. (Under MHRD Programme)
  15. Tanmoy Chatterjee [2014-2018], *Topic: Novel Integrated Computational Models for Robust Design Optimization*. (Under MHRD Programme). [Presently at University of Surrey as Lecturer]
  16. Vipul Bhardwaj [2013-2018], *Topic: Piezoelectric and Mechanical Behaviour of Doped and Undoped ZnO Thin Films*. (Co-supervising with Prof. R. Jayaganathan, Materials and Metallurgical Engineering, IITR). [Presently at Northwestern Polytechnical University, China as PDRA]
  17. Souvik Chakrabarti [2013-2016], *Topic: A Multilevel Paradigm for Stochastic Computations*. (Under MHRD Programme) [Presently Assistant Professor at Department of Applied Mechanics, IIT Delhi.]
  18. Sowjanya Motana [2011-2016], *Topic: Optical Properties of Doped and Undoped ZnO Nanostructured Coatings (Experimental and Simulation Studies)*. (Under CSIR Programme) (Co-supervised with Prof. R. Jayaganathan, Centre of Nanotechnology, IITR).

## Details of Projects

1. Multiscale Modelling and Simulation of Layered Fibre Reinforced Nanocomposite, *DMSRDE, Kanpur*, [2021-2024], Amount: Rs. 49.64 Lakhs, Role: PI.
2. Experimental and Theoretical Studies of High Ballistic impact on Multi-Layered Nanocomposites, *ARMREB, TBRL, Chandigarh*, [2021-2024], Amount: Rs. 122.02 Lakhs, Role: Co-PI.

3. Topology optimization of large-scale engineering structures: numerical simulations and experimental investigations, *DRDL, Hyderabad*, [2020-2023], Amount: Rs. 45.21 Lakhs, Role: PI.
4. Development of a design-through-analysis methodology based on isogeometric technology: Application to phase-field fracture and topology optimization, *SERB, DST*, [2020-2023], Amount: Rs. 21.94 Lakhs, Role: PI.
5. Fracture and fatigue studies in textile-based auxetic composite, *IITR-ISRO Space Technology Cell*, [2020-2022], Amount: Rs. 27.24 Lakhs, Role: Co-PI.
6. Reliability-based and Robust design optimization of large-scale systems, *CSIR*, [2016-2019], Amount: Rs. 15.36 Lakhs, Role: PI.
7. Mechanical Properties of Nano-Silica Based High-Performance Concrete, *NBCC*, [2013-2017], Amount: Rs. 24 Lakhs, Role: Co-PI.
8. Robust design optimization of large-scale systems, *Royal Society*, [2015-2016], Amount: £6000, Role: PI.
9. Elasticity & Piezoelectricity in Semiconducting Nanostructures, *SERB, DST*, [2013-2016], Amount: Rs. 25.22 Lakhs, Role: PI.
10. Coupled Molecular Dynamics-XEFM simulation for quasi-brittle material failure, *Royal Society*, [2012-2013], Amount: £6000, Role: PI.

### Professional Activities

Editorial Duties	Subject Editor of the Applied Mathematical Modelling [1/2016-]. Editorial Board member of the Applied Mathematical Modelling [1/2016-]. Editorial Board member of the Physics Express [7/2010-12/2013].
Membership	Life Member of Indian Concrete Institute [01/2015-Present]. Engineering Mechanics Institute [10/2012-Present]. Associate Member of the ASCE [10/2012-Present].
Article Reviewer	<ol style="list-style-type: none"> <li>1. Computer Methods in Applied Mechanics and Engineering.</li> <li>2. Applied Mathematical Modelling.</li> <li>3. Computational Materials Science.</li> <li>4. Applied Physics Letters.</li> <li>5. Physica E: Low-dimensional Systems &amp; Nanostructures.</li> <li>6. Journal of Physics and Chemistry of Solids.</li> <li>7. Composites Part B: Engineering.</li> <li>8. Composite Structures.</li> <li>9. Nanotechnology.</li> <li>10. Journal of Machine Learning Research.</li> <li>11. SIAM/ASA Journal on Uncertainty Quantification.</li> <li>12. ASCE Journal of Structural Engineering.</li> </ol>

## Appendix: List of Publications

### Patents

1. Yadav, S., Singh, S. B., Chowdhury, R., and Das, S., A COLD ROLLED BAINITIC STEEL WITH HIGH STRENGTH AND HIGH ELONGATION, *Application no. 202211044546 dated 04/08/2022 (SSCPL/IITR/2022-23/CRN200)*. [Patent Filed]
2. Verma, P., Chowdhury, R., and Chakrabarti, A., PROCESS FOR VALORIZATION OF GROUND GRANULATED BLAST FURNACE SLAG FOR SYNTHESIS OF CALCIUM SILICATE HYDRATE AS A PRE-FORMED HARDENING ACCELERATOR FOR EARLY STRENGTH GAIN IN CONCRETE, *Application no. 202311005643 dated 28/01/2023 (IN23/0075)*. [Patent Filed]

### Book Chapter

1. Chatterjee, T. and Chowdhury, R., Adaptive refined-model-based approach for robust design optimization, *Handbook of Research on Predictive Modeling and Optimization Methods in Science and Engineering*, IGI Global, 2018.
2. Chatterjee, T. and Chowdhury, R., Adaptive refined model based approach for robust design optimization, *Predictive Modeling and Optimization Methods in Science and Engineering*, IGI Global, 2017.
3. Chatterjee, T. and Chowdhury, R., Improved sparse approximation models for stochastic computations, *Neural Computing in Engineering and Science*, Elsevier, 2017.
4. Chakraborty, S. and Chowdhury, R., Polynomial Correlated Function Expansion, *Modeling and Simulation Techniques in Structural Engineering*, IGI Global, 2017.
5. Chakraborty, S. and Chowdhury, R., A hybrid approach for solution of Fokker-Planck equation, *Advances in Structural Engineering*, Springer, India, 2015.
6. Chowdhury, R., Rao, B.N., and Prasad, A.M., A practical solution of the random eigenvalue problems using factorized decomposition technique, *Computational Mechanics*, Springer, Heidelberg, 2009.
7. Chowdhury, R., and Rao, B.N. and Prasad, A.M., HDMR based stochastic finite element analysis for random field problems, *Safety, Reliability and Risk of Structures, Infrastructures and Engineering*, CRC Press, Boca Raton, FL, USA, 2009.

### Journal Papers

1. Padhi, A. P., Chakraborty, S., Chakrabarti, A., and Chowdhury, R., Efficient hybrid topology optimization using GPU and homogenization based multigrid approach, *Engineering with Computers* (2022) (Accepted).
2. Bijaya, A., Chowdhury Roy, S., and Chowdhury, R., Multiscale phase-field approach for investigation of anisotropic fracture properties of architected materials, *Mechanics of Materials*, 176 (2023), pp. 104528:1-19.
3. Krishnan Meenu, U., Gupta, A., and Chowdhury, R., Adaptive phase-field modelling of brittle fracture using a robust combination of error-estimator and markers, *Engineering Fracture Mechanics*, 274 (2022), pp. 108758:1-22.
4. Gupta, A., Krishnan Meenu, U., Mandal, T. K., Chowdhury, R., and Nguyen, V. P., An adaptive mesh refinement algorithm for phase-field fracture models: application to brittle, cohesive, and dynamic fracture, *Computer Methods in Applied Mechanics and Engineering*, 399 (2022), pp. 115347:1-28.
5. Gupta, A., Mamindlapelly, B., Karuthedath, P. L., Chowdhury, R., and Chakrabarti, A., Adaptive isogeometric topology optimization using PHT splines, *Computer Methods in Applied Mechanics and Engineering*, 395 (2022), pp. 114993:1-32.
6. Agrawal, G., Gupta, A., Chowdhury, R., and Chakrabarti, A., Robust Topology Optimization of Negative Poisson's Ratio Metamaterials under Material Uncertainty, *Finite Elements in Analysis and Design*, 198 (2022), pp. 103649:1-10.
7. Verma, P., Chowdhury, R., and Chakrabarti, A., Role of graphene-based materials (GO) in improving physicochemical properties of cementitious nano-composites: a review, *Journal of Materials Science*, 56 (2021), pp. 19329–19358.

8. Chatterjee, T., Friswell, M. I., Adhikari, S., and Chowdhury, R., A global two-layer meta-model for response statistics in robust design optimization, *Engineering Optimization*, 54(1) (2022), pp. 153-169.
9. Mandal, T. K., Gupta, A., Nguyen, V. P., Chowdhury, R., and Vaucorbeil, A. d., A length scale insensitive phase field model for brittle fracture of hyperelastic solids, *Engineering Fracture Mechanics*, 236 (2020), pp. 107196:1-32.
10. Gupta, A., Krishnan Meenu, U., Chowdhury, R., and Chakrabarti, A., An auto-adaptive sub-stepping algorithm for phase-field modeling of brittle fracture, *Theoretical and Applied Fracture Mechanics*, 108(2020), pp. 102622: 1-18.
11. Sowjanya, M., Shariq, M., Alajlani, Y., Pamu, D., Chowdhury, R., Jayaganthan, R., Florence, S., Haider, M., Effect of Ar: O<sub>2</sub> gas atmosphere on optical properties of Y<sub>2</sub>O<sub>3</sub>-doped ZnO thin films by RF sputtering, *Europhysics Letters*, 129[3] (2020), pp. 34003: 1-6.
12. Madke, R. R., and Chowdhury, R., Anti-impact behavior of auxetic sandwich structure with braided face sheets and 3D re-entrant cores, *Composite Structures*, 236 (2020), pp. 111838:1-16.
13. Madke, R. R., and Chowdhury, R., A multiscale continuum model for inelastic behavior of woven composite, *Composite Structures*, 226 (2019), pp. 111267:1-19.
14. Chakraborty, S., and Chowdhury, R., Graph theoretic approach assisted Gaussian process for nonlinear stochastic dynamic analysis under generalized loading, *ASCE Journal of Engineering Mechanics*, 145[12] (2019), pp. 04019105:1-16.
15. Goswami, S., Chakraborty, S., Chowdhury, R., Rabczuk, T., Threshold shift method for reliability based design optimization, *Structural and Multidisciplinary Optimization*, 60 (2019), pp. 2053-2072.
16. Chatterjee, T., Chowdhury, R., and Palaniappan, R., Decoupling uncertainty quantification from robust design optimization, *Structural and Multidisciplinary Optimization*, 59 (2019), pp. 1969-1990.
17. Chatterjee, T., Chakraborty, S., and Chowdhury, R., Locally refined adaptive sparse surrogate based approach for uncertainty quantification, *ASCE Journal of Engineering Mechanics*, 145[5] (2019), pp. 06019001:1-10.
18. Chatterjee, T., Chakraborty, S., and Chowdhury, R., A critical review of surrogate assisted robust design optimization, *Archives of Computational Methods in Engineering*, 26[1] (2019), pp. 245-274.
19. Chatterjee, T., Chakraborty, S., and Chowdhury, R., Analytical Moment Based Approximation for Robust Design Optimization, *Structural and Multidisciplinary Optimization*, 58[5] (2018), pp. 2135-2162.
20. Bhardwaj, V., Kumar, A., Chowdhury, R. and Jayaganthan, R., Nanoindentation and Nanoscratch Behavior of ZnO:Pr Thin films Deposited by DC-Sputtering, *Journal of Materials Research*, 33[17] (2018), pp. 2533-2544).
21. Chatterjee, T., and Chowdhury, R., 'hp adaptive' Model based Approximation of Moment Free Sensitivity Indices, *Computer Methods in Applied Mechanics and Engineering*, 332 (2018), pp. 572-599.
22. Chatterjee, T., and Chowdhury, R., Refined sparse bayesian learning configuration for stochastic response analysis, *Probabilistic Engineering Mechanics*, 52 (2018), pp. 15-27.
23. Chakraborty, S., and Chowdhury, R., Galerkin based generalised ANOVA for the solution of stochastic steady state diffusion problems, *Probabilistic Engineering Mechanics*, 50 (2017), pp. 36-44.
24. Chakraborty, S., and Chowdhury, R., An efficient algorithm for building locally refined 'hp adaptive' H-PCFE: Application to uncertainty quantification, *Journal of Computational Physics*, 315 (2017), pp. 59-79.
25. Majumder, D., Chakraborty, S., and Chowdhury, R., Probabilistic analysis of tunnels: A hybrid polynomial correlated function expansion based approach, *Tunnelling and Underground Space Technology*, 70 (2017), pp. 89-104.
26. Bhardwaj, V., Chowdhury, R. and Jayaganthan, R., Adhesion strength and nanomechanical characterization of ZnO thin films, *Journal of Materials Research*, 32[8] (2017), pp. 1432-1443.
27. Chakraborty, S., Chatterjee, T., Chowdhury, R. and Adhikari, S., Robust design optimization for crashworthiness of vehicle side impact, *ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part B: Mechanical Engineering*, 3[3] (2017), pp. 031002:1-9.

28. Chatterjee, T. and Chowdhury, R., An efficient sparse Bayesian learning framework for stochastic response analysis, *Structural Safety*, 68 (2017), pp. 1-14.
29. Chakraborty, S. and Chowdhury, R., Towards 'h-p adaptive' generalised ANOVA, *Computer Methods in Applied Mechanics and Engineering*, 320 (2017), pp. 558-581.
30. Chakraborty, S., Chatterjee, T., Chowdhury, R. and Adhikari, S., A surrogate based multi-fidelity approach for robust design optimization, *Applied Mathematical Modelling*, 47 (2017), pp. 726-744.
31. Chakraborty, S. and Chowdhury, R., Moment independent sensitivity analysis - A hybrid PFCE based approach, *ASCE Journal of Computing in Civil Engineering*, (2017), pp. 0601600:1-11.
32. Mukhopadhyay, T., Chakraborty, S. Dey, S., Adhikari, S. and Chowdhury, R., A critical assessment of kriging model variants for high-fidelity uncertainty quantification in dynamics of composite shells, *Archives of Computational Methods in Engineering*, 24[3] (2017), pp. 495-518.
33. Chakraborty, S. and Chowdhury, R., Hybrid framework for the estimation of rare failure event probability, *ASCE Journal of Engineering Mechanics*, (2017), pp. 04017010:1-13.
34. Chakraborty, S. and Chowdhury, R., A hybrid approach for global sensitivity analysis, *Reliability Engineering & System Safety*, 158 (2017), pp. 50-57.
35. Chatterjee, T. and Chowdhury, R., An adaptive bi-level approximation technique for multi objective evolutionary optimization, *ASCE Journal of Computing in Civil Engineering*, (2016), pp. 04016071:1-16.
36. Chakraborty, S. and Chowdhury, R., Modelling uncertainty in incompressible flow simulation using Galerkin based generalised ANOVA, *Computer Physics Communications*, 208 (2016), pp. 73-91.
37. Chakraborty, S. and Chowdhury, R., Sequential experimental design based generalised ANOVA, *Journal of Computational Physics*, 317 (2016), pp. 15-32.
38. Mukhopadhyay, T., Chowdhury, R., and Chakraborti, A., Structural damage identification: A random sampling-high dimensional model representation approach, *Advances in Structural Engineering*, SAGE, 19[6] (2016), pp. 908-927.
39. Bhardwaj, V., Chowdhury, R. and Jayaganathan, R., Nanomechanical and microstructural characterization of sputter deposited ZnO thin films, *Applied Surface Science*, 389 (2016), pp. 1023-1032.
40. Chatterjee, T., Chakraborty, S. and Chowdhury, R., A bi-level approximation tool for the computation of FRFs in stochastic dynamic systems, *Mechanical Systems and Signal Processing*, 70-71 (2016), pp. 484-505.
41. Chakraborty, S. and Chowdhury, R., Assessment of polynomial correlated function expansion for high-fidelity structural reliability analysis, *Structural Safety*, 59 (2016), pp. 9-19.
42. Chakraborty, S. Mandal, B., Chowdhury, R., and Chakraborti, A., Stochastic free vibration analysis of laminated composite plates using polynomial correlated function expansion, *Composite Structures*, 135 [3] (2016), pp. 236-249.
43. Mukhopadhyay, T., Dey, T.K., Chowdhury, R., Chakraborti, A., and Adhikari, S., Optimum design of FRP bridge deck: An efficient RS-HDMR based approach, *Structural and Multidisciplinary Optimization*, 52 [3] (2015), pp. 459-477.
44. Kumar, A., Chakraborti, A., Bhargava, P., and Chowdhury, R., Probabilistic failure analysis of laminated sandwich shells based on higher order zigzag theory, *Journal of Sandwich Structures and Materials*, 17[5] (2015), pp. 546-561.
45. Chakraborty, S. and Chowdhury, R., Multivariate function approximations using D-MORPH algorithm, *Applied Mathematical Modelling*, 39 [23-24] (2015), pp. 7155-7180.
46. Chakraborty, S. and Chowdhury, R., A semi-analytical framework for structural reliability analysis, *Computer Methods in Applied Mechanics and Engineering*, 289 (2015), pp. 475-497.
47. Chakraborty, S. and Chowdhury, R., Polynomial correlated function expansion for nonlinear stochastic dynamic analysis, *ASCE Journal of Engineering Mechanics*, 141[3] (2015), Article No.: 04014132, pp. 1-11.
48. Madke, R. R., Chakraborty, S. and Chowdhury, R., Multiscale approach for the nonlinear behaviour of cementitious composite, *Computational Material Science*, 93 (2014), pp. 29-35.
49. Ray, S. J., and Chowdhury, R., Double gated single molecular transistor for charge detection, *Journal of Applied Physics*, 116 (2014), pp. 034307:1-7.

50. Adhikari, S., Flores, E. I. S., Scarpa, F., Chowdhury, R. and Friswell, M. I., A hybrid atomistic approach for the mechanics of DNA molecules, *ASME Journal of Nanotechnology in Engineering and Medicine*, 4[4] (2014), pp. 041006:1-7.
51. Sarma, J. V. N., Chowdhury, R., Jayaganthan, R., and Scarpa, F., Atomistic studies on tensile mechanics of BN nanotubes in the presence of defects, *International Journal of Nanoscience*, 13[1] (2014), pp. 1450005:1-9.
52. Sarma, J. V. N., Chowdhury, R., and Jayaganthan, R., Graphyne based single electron transistor: ab-initio analysis, *NANO: Brief Reports and Reviews*, 9[3] (2014), pp. 1450032:1-8.
53. Kam, K., Scarpa, F., Adhikari, S., and Chowdhury, R., Graphene nanofilm as pressure and force sensor: a mechanical analysis, *Physica Status Solidi B*, 250[10] (2013), pp. 2085-2089.
54. Sarma, J. V. N., Chowdhury, R., and Jayaganthan, R., Molecular dynamics investigation of the thermomechanical behavior of monolayer GaN, *Journal of Applied Physics*, 113 (2013), pp. 243504:1-7.
55. Allegri, G., Scarpa, F., Chowdhury, R., and Adhikari, S., Wave propagation in periodically supported nanoribbons: A nonlocal elasticity approach, *ASME Journal of Vibration and Acoustics*, 135, (2013), pp. 041017:1-8.
56. Sarma, J. V. N., Chowdhury, R., and Jayaganthan, R., Mechanical behavior of gallium nitride nanosheets using molecular dynamics, *Computational Materials Science*, 75 (2013), pp. 29-34.
57. Zhang, J., Wang, C. Y., and Chowdhury, R., and Adhikari, S., Size and temperature dependent piezoelectric properties of gallium nitride nanowires, *Scripta Materialia*, 68[8] (2013), pp. 627-630.
58. Chandra, Y., Scarpa, F., Chowdhury, R., Adhikari, S., and Seinz, J., Multiscale hybrid atomistic-FE approach for the nonlinear tensile behaviour of graphene nanocomposites, *Composites Part A: Applied Science and Manufacturing*, 46 (2013), pp. 147-153.
59. Zhang, J., Wang, C. Y., and Chowdhury, R., and Adhikari, S., Small-scale effect on the mechanical properties of metallic nanotubes, *Applied Physics Letters*, 101 (2012), pp. 093109:1-4.
60. Chowdhury, R., and Adhikari, S., Fuzzy parametric uncertainty analysis of linear dynamical systems: A surrogate modeling approach, *Mechanical Systems and Signal Processing*, 32 (2012), pp. 5-17.
61. Chowdhury, R., Scarpa, F., and Adhikari, S., Molecular-scale bio-sensing using armchair graphene, *Journal of Applied Physics*, 112[1] (2012), pp. 014905:1-6.
62. Adhikari, S., and Chowdhury, R., Zeptogram sensing from gigahertz vibration: Graphene based nanosensor, *Physica E: Low-dimensional Systems and Nanostructures*, 44[7-8] (2012), pp. 1528-1534.
63. Chowdhury, R., Conductance of graphene nanoribbons under mechanical deformation, *Physica E: Low-dimensional Systems and Nanostructures*, 44[7-8] (2012), pp. 1256-1259.
64. Chandra, Y., Chowdhury, R., Scarpa, F., Adhikari, S., Seinz, J., Arnold, C., Murmu, T., and Bould, D., Vibration frequency of graphene based composites: A multiscale approach, *Materials Science & Engineering B*, 177[3] (2012), pp. 303-310.
65. Chowdhury, R., Adhikari, S., and Rees, P., Graphene based single molecule nanojunction, *Physica B: Condensed Matter*, 407[5] (2012), pp. 855-858.
66. Murugan, S., Chowdhury, R., Adhikari, S., and Friswell, M.I., Helicopter aeroelastic analysis with specially uncertain rotor blade properties, *Aerospace Science and Technology*, 16[1] (2012), pp. 29-39.
67. Dutta, S. C., and Chowdhury, R., Effect of gravity loading on inelastic seismic demand of structures, *Journal of Earthquake and Tsunami*, 6[4] (2012), pp. 1250022:1-16.
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