Amar Nath Roy Chowdhury
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Research Interests: Multiscale structural mechanics, thin-walled structures, sustainable structural engineering.

Educational Qualifications

2010-2014	**Doctor of Philosophy.** Department of Civil and Environmental Engineering, National University of Singapore, Singapore. **Thesis title:** *Comprehensive Molecular Dynamics Simulations of Carbon Nanotubes and Under Axial force or torsion or vibration and new continuum models.* **Thesis advisors:** Dr. Wang Chien Ming.
2006-2008	**Master of Technology.** Department of Civil and Environmental Engineering, Indian Institute of Technology Bombay, Mumbai, India. **Thesis title:** *Estimation of hysteretic energy demand including P-Δ effect and asymmetry in plan of structure.* **Thesis advisor:** Dr. Siddhartha Ghosh.
2002-2006	**Bachelor of Engineering.** Department of Civil Engineering, Jadavpur University, Kolkata, India.

Teaching Experiences

Co-Instructor (2016)	**Design Project I: Design of Wooden Tower.** Taught the use of ABAQUS to the undergraduate student.
Co-Instructor (2015, 2016)	**Major Design Project I** : **Design of energy efficient building.** Taught the use of ABAQUS and COMSOL to the undergraduate student.
Teaching Assistant (2015)	Assisted my supervisor in guiding a final year student to complete his project on developing plate models for graphyne nanosheets based on atomistic simulation.
Teaching Assistant (2013)	**The design of Concrete Structures.** Undertaken tutorial classes and assisted students to prepare for the course.
Teaching Assistant (2011-2012)	**Structural Analysis:** Taught structural analysis software ETABS for analyzing concrete structures.
Teaching Assistant (2011)	**Engineering Mechanics:** Undertaken tutorial classes to aid students in solving problems in mechanics.
Teaching Assistant (2007)	**Plastic Analysis of Structures:** Helped students to learn Drain 2 DX used for inelastic analysis of steel structures.
Instructor (2006)	**Applied Mechanics Laboratory:** Taught experimental techniques to study mechanics of material. Techniques taught include, buckling of rod, torsion of bars, tensile testing, and shear response of elastomeric bearing pad.

Publications

- Wang, C M, Ke, L L, **Roy Chowdhury**, **A N**, Yang, J, Kitipornchai, S, and Fernando, D (2017). Critical examination of midplane and neutral plane formulations for vibration analysis of FGM beams. *Engineering Structures*, 130 (1), 275-281.
- **Roy Chowdhury, A N**, Wang, C M, (2016). Bending, buckling, and vibration of equilateral simply supported or clamped triangular plates with rounded corners. *Journal of Engineering Mechanics*, 0(0), 04016074.
- **Roy Chowdhury, A N**, Koh, S J A, and Wang, C M (2015). Nonlinear-elastic membrane-shell model for single-walled carbon nanotubes under uni-axial deformation. *Computational Materials Science*, 97, pp. 237-244.

- **Roy Chowdhury, A N**, Wang, C M, and Koh, S J A (2014). Continuum shell model for buckling of single-walled carbon nanotubes with different chiral angles. *International Journal of Structural Stability and Dynamics*, 14 (4), Article No. 1450006.
- **Roy Chowdhury, A N**, Wang, C M, and Koh, S J A (2014). Continuum shell model for buckling of armchair carbon nanotubes under compression or torsion. *International Journal of Applied Mechanics*, 6 (1), 1450006.
- Wang, C M, **Roy Chowdhury, A N**, Koh, S J A, and Zhang, Y Y (2014). Molecular dynamics simulation and continuum shell model for buckling analysis of carbon nanotubes. *Modeling of carbon nanotubes, graphene and their composites*, K. I. Tserpes, and N. Silvestre, eds., Springer International Publishing, pp. 239-273.
- Rathore, M, **Roy Chowdhury, A**, and Ghosh, S (2011). Approximate methods for estimating hysteretic energy demand on plan-asymmetric buildings. *Journal of Earthquake Engineering*, 15, pp 99-123.
- **Roy Chowdhury A**, Ghosh, S (2010). The inclusion of P-Δ effect in the estimation of hysteretic energy demand based on modal pushover analysis, *ISET Journal of Earthquake Technology*, 47, pp 75-86.
- C.M. Wang, L.L. Ke, **A.N. Roy Chowdhury**, J. Yang, S. Kitipornchai and D. Fernando. Critical examination of midplane and neutral plane formulations for vibration analysis of functionally graded beams (accepted).

Conference Articles and Presentations

- **Roy Chowdhury**, **A N**, and Wang, C M, Vibration analysis of stocky single-walled carbon nanotubes using operational modal analysis and a proposed continuum shell model, International Symposium on Engineering Science, Singapore, May 19-20, 2015.
- **Roy Chowdhury, A N**, Koh, S J A, and Wang, C M, Nonlinear-elastic membrane-shell model for single-walled carbon nanotubes. 23rd International Workshop on Computational Mechanics of Materials, Singapore, October 2-4, 2013. (paper presented)
- **Roy Chowdhury, A N**, Wang, C M, Molecular simulation results for axial buckling of double walled carbon nanotubes, The 7th International Conference on Advances in Steel Structures, Nanjing, China, April 14-16, 2012 (paper presented).
- Wang, C. M., **Roy Chowdhury, A N**, Molecular dynamics simulation results for buckling of carbon nanotubes with small aspect ratios. International Congress on Computational Mechanics and Simulation (ICCMS), IIT Hyderabad, December 2012.
- **Roy Chowdhury, A**, Ghosh, S, Approximate methods for estimating hysteretic energy demand on plan-asymmetric buildings. WCCE-ECCE-TCCE Joint Conference on Earthquake and Tsunami, Istanbul, Turkey, June 22-24, 2009.

- **Roy Chowdhury, A**, Ghosh, S, Estimation of hysteretic energy demand including P-Δ effect using equivalent systems. International Workshop on Earthquake Hazards and Mitigation (EHAM) held at IIT Guwahati in December 2007 (paper presented).
- Das, A, **Roy Chowdhury, A**, and Das, M, Nonlinear Deflection Analysis of Reinforced Concrete Beams, 12th Institute of Engineers India Convocation, Bhopal, India, July, 2006.

Awards and Scholarships

- Awarded graduate research scholarship by the National University of Singapore to pursue Doctor of Philosophy in Department of Civil and Environmental Engineering, National University of Singapore.
- Awarded University Grant Commission (UGC) scholarship to pursue Masters of Technology in Civil Engineering in Department of Civil Engineering at Indian Institute of Technology, India.
- Third prize winner in The Best Innovative Structural Steel Design Contest conducted by Institute for Steel Development and Growth (INSDAAG), July 2006.
- Won the first prize for the paper entitled *"Nonlinear Deflection Analysis of Reinforced Concrete Beams*" in 12th Institute of Engineers India Convocation, October 2004.

Academic Work Experience

2014 Jul – 2014 Dec: Worked as a research engineer in the Department of Civil and Environmental Engineering, National University of Singapore, Singapore.

2015 Jan – 2016 Dec: Working as a research fellow in the Department of Civil and Environmental Engineering, National University of Singapore, Singapore.

2017 May – Present: Assistant Professor in the Department of Civil and Environmental Engineering, Indian Institute of Technology Ropar, Punjab, India.

Industrial Experience

2008 July - 2010 June: Junior structural engineer in Meinhardt Singapore Pvt Ltd from 2008 to 2010. Projects handled during this period are:

- **Reflection Towers, Singapore:** These are six multi-storied reinforced concrete towers at Keppel Bay Singapore. We were assigned to perform nonlinear analysis on these towers incorporating time-dependent properties of concrete.
- **Paragon shopping center, Singapore:** This is an existing shopping center in Singapore. For this project we investigated the floor vibration response due to rhythmic activity.

- **Gardens by the Bay, Singapore:** Two long span steel seashell-shaped roofs each covering around 150 m^2 were constructed near Marina Bay Singapore. I was involved in analysis and design of the roof structures. As a part of my work, I also checked the robustness of the structures by performing construction sequence and progressive collapse analysis.
- **Asia Square Tower I, Singapore:** This is a multi-storied concrete building situated in CBD area of Singapore. I was involved in analyzing and designing the structure.

Software and Programming Skills

- Fortran, Python, Excel visual basic.
- ABAQUS, LAMMPS, WX-Maxima, STAAD Pro., Drain-2DX, Opensees, SAP, SAFE, ETABS, Scilab.