Nomesh Bhojkumar Bolia

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EDUCATION

University of North Carolina at Chapel Hill: PhD, Operations Research, Aug 2005 – October 2009

Index Policies for Resource Allocation in Wireless Networks
Jan 2007 – Aug 2009 *PhD Dissertation@ UNC, Chapel Hill*

CTMC Model for Juvenile Drug Courts
June 2006 – October 2007 *Health Policy Research @ UNC, Chapel Hill*

Indian Institute of Technology (IIT), Bombay: Bachelor of Technology, July 1999 – August 2003

AWARDS and HONORS

- J. M. Mahajan award for Outstanding Young Teacher, IIT Delhi, 2019
- Rashtriya Gaurav Award (National Honour Award) by India International Friendship Society, 2019 for overall contributions that "inspire others towards certain remarkable achievement"
- National Coordinator for ASEAN PhD Fellowship programme for ASEAN students to study at IITs, the largest foreign capacity development programme of the Government of India
- Selected Co-Coordinator of the Centre of Excellence for Research on Clean Air, IIT Delhi
- Volvo Research and Educational Foundations (VREF) Future Urban Transport research grant (international call for grant bids) in 2014 to work on Urban Freight (International)
- Volvo Research and Educational Foundations Study Visit Grant in 2013 for joint work on Urban Freight with Rensselaer Polytechnic Institute (International)
- Indo-US Research Fellowship 2013 by Indo-US Forum for Science and Technology

EXPERIENCE

- *Associate Professor, Department Mechanical Engineering, IIT Delhi, June'14 – October 2019*
- *Assistant Professor, Department Mechanical Engineering, IIT Delhi, December'09 – June 2014*
- *Junior Research Fellow, Tata Institute of Fundamental Research, India, Jan'04 – May'05*
- *Assistant Business Analyst, Infotech Financials Private Limited, India, Aug'03 – Dec'03*

SPONSORED RESEARCH PROJECTS

❖ **Summary:** 10+ Sponsored Research Grants, from Domestic/International Agencies/Corporations, Public/Private Non-Profit/For-Profit Corporations; Total Worth: INR 37.5 Million+

❖ **Selected List:**

- Air Pollution Reduction Around the World: Governance and Implementation Issues [Funded by CERCA, engagement with Japanese Government/Stakeholders, Chinese ongoing]
- Data Driven Legal Reforms in India: FIRP, IIT Delhi
- Data Driven Education Governance in India: Funded by Central Square Foundation
- Governance Scale Up: Framework for scaling up the impact of projects recognized by the National e-Governance Award [Completed, study done for Department of Administrative Reforms and Public Grievances, Government of India]

- Select Study of Freight Movement: Funded by Volvo Research and Educational Foundation

- Urban City Analysis to Measure its Resiliency and Improve Emergency Response: Funded by Human Settlement Research Institute, HUDCO

- Incentivizing the use of Public Transport in India. Funded by the Department of Science and Technology, Government of India

- Scheduling on Diagnostic Equipment: Funded by Philips Research Asia

CONSULTING PROJECTS

❖ **Summary:** 4+ Consulting Assignments, from Domestic/International, Non-Profit/For-Profit Corporations; Total Worth: INR 4.2 Million+

❖ **Selected List:**

- An Operations Research Algorithm for Maximisation of TEUs Loaded on Double Stack Trains, Container Corporation of India Limited

- Maintenance Cost Reduction for Infrastructure Equipment, General Electric-India Technology Center

- Finished Goods Inventory Management System, JCB India Private Limited

- Climate Smart Agricultural prioritization toolkits, International Water Management Institute

RESEARCH SUMMARY

- Doctoral (PhD) Advising Completed: 6 students graduated with PhD, with current profile as faculty members, startups and international corporations
- Doctor (PhD) Advising Ongoing: 9 students, 4 within approx. a year of graduating, 4 to begin work on areas similar to the research project proposed for the Research Stay collaboration
- MTech Theses: 23 Completed, 3 Ongoing (to be completed by May 2020), most of them in the broad area of sustainable/public transport
- Other Advising: several post-doctoral fellows mentored on sponsored projects for varying periods, 35 undergraduate theses supervised with some of them yielding publications/research proposals & 5 ongoing – mostly in areas aligned to transportation
- Peer Reviewed International Journal Publications: 36 accepted/published, 12 under various stages of review, detailed list included at the end of this document
- Presentations/Publications in Peer Reviewed International Conferences: 31 presented/published in conferences hosted around the world, details list at the end

PRODUCTS DEVELOPED/DEPLOYED

- **Double Stack Loading Planner:** Software to make the optimal train loading plan for Container Corporation of India Limited, taking inputs from the container inventory maintained in their oracle server, and giving output in the form. A novel and pioneering customized product involving real life application of optimization tools. Deployed in the industry, demonstrated to yield savings upward of tens of millions when used consistently.

- **Climate Smart Agriculture Toolkit:** Software for optimal decision making in the area of agriculture planning. Includes two parts: Climate Smart Agriculture Prioritization Toolkit, and Food Stock Planning toolkit. Both take as an input past data of agricultural production, and various other policy parameters, and provide the required output analysis to make policy decisions on how much land to allocate to which crop and where; and the warehouse location and distribution plan after appropriate optimization. Also enables the user to perform output analysis in the Graphical User Interface Developed. Novel tool, used in India and other parts of South Asia by the International Water Management Institute (IWMI).
- **Scheduler for MRI Machines:** Software developed for Philips Research (Asia). Enables the scheduling and rescheduling of patients (in case of disruption due to unforeseen circumstances) on MRI machines. A mathematical programme is solved using MS Solver Foundation, and appropriate graphical user interface developed.

STARTUPS

- **Road Transport Exchange:** Product developed to aggregate and streamline road freight transport as part of a startup selected for incubation in the prestigious IIT Delhi Technology Business Incubation Unit. The startup acquired hundreds of customers and trucking vendors to enable seamless truck-load matching and price discovery.

- **Vidyalaya Vistaar:** A social enterprise, as part of a non-profit, to improve education quality in government schools numbering in thousands. A systematic framework and education tools/products developed, government and non-government stakeholders engaged and funds raised from private/public sources. Done in partnership with the "Unnat Bharat Abhiyan" (Campaign for Developed India) project of Government of India, and state government.

SELECTED TRAINING PROGRAMMES

- International Workshop on Urban Freight, for various stakeholders (public, private players, researchers). April 7-8, 2014
- Executive Education Programme for JCB. December 21-26, 2011
- Management Development Programme (MDP) for Rural Enterprises. November 10-19, 2011

ADDITIONAL

- Member, Board of Governors, National Institute of Industrial Engineering (NITIE), an institute of national importance of Ministry of Human Resource Development, Government Of India.
- Member, Board of Governors, Footwear Design and Development Institute, an institute under the Ministry of Commerce and Industry, Government of India
- Member, Institute of Eminence (IoE) Core Committee, IIT Delhi. IoE is an honour granted by Government of India to select top-notch universities in India, under a programme that funds and facilitates the creation of world class universities in India
- Associated Faculty of Transportation Research and Injury Prevention Programme, IIT Delhi
- Former Programme Coordinator, MTech in Industrial Engineering at IIT Delhi.
- Reviewer for several top journals such as IEEE Transactions on Vehicular Technology and International Journal of Production Research
- Member: IEEE, INFORMS; Mentor for several student clubs such as Tech Innovation Club

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LIST OF PUBLICATIONS

PEER REVIEWED INTERNATIONAL JOURNAL PUBLICATIONS

1. R. Gadepalli, G. Tiwari & N. Bolia, “Operational efficiency of competing city bus and paratransit systems in Indian cities”, Accepted at Journal of Advanced Transportation, 2019
2. H. Suman & N. Bolia, “Improvement in Direct Bus Services through Route Planning”, Accepted at Transport Policy, 81, 2019, 263-274
3. A. Bhatnagar & N. Bolia, “Improved Governance of Indian School System through School Consolidation”, Accepted at Journal of Policy Modeling, 2019
4. N. D. Bakshi, G. Tiwari & N. Bolia, “Influence of Urban Form variables on Freight Generation”, Accepted at Case Studies on Transport Policy, 2019
5. H. Suman & N. Bolia, "Mitigation of Overcrowding in Buses through Bus Planning", Public Transport, 11, 2019, 159 - 187
6. H. Suman & N. Bolia, “A Review of Service Assessment Attributes and Improvement Strategies for Public Transport”, Transportation in Developing Economies, 5, 2019, 1-17
7. H. Suman, N. Bolia & G. Tiwari, “Perception of Potential Bus Users and Impact of Feasible Interventions Improve Quality of Bus Services, Case Study on Trans. Policies, 6, 2018, 591-602
8. R. Gadepalli, G. Tiwari & N. Bolia, “Role of User’s Socio-Economic and Travel Characteristics in Mode Choice Between City Bus and Informal Transit Services: Lessons from Household Surveys in Visakhapatnam, India”, Accepted Journal of Transport Geography, 2019
9. Lakshay & N. Bolia, "Operating Strategies of Buses for Mass Evacuation", Safety Science, 111, 2019, 167-178
10. Lakshay, A. P. Tiwari, A.P. & N. Bolia, “Urban Planning for disaster management”, accepted at International Journal of Health System and Disaster Management (IJHSDM)
11. Lakshay & N. Bolia, "Pedestrian Control Measures for Efficient Emergency response management in mass gatherings", International Journal of Disaster Resilience in the Built Environment, vol. 9 (3), 2018, 273-290
12. A. Upadhyay, Weihua Gu & N. Bolia, “Optimal Loading of Double-Stack Container Trains”, Transportation Research Part E: Logistics and Transportation Review, vol. 107, 2017, 1-22
13. H. Suman, N. Bolia & G. Tiwari, "Comparing Public Bus Transport Service Attributes in Delhi and Mumbai: Policy Implications for Improving Bus Services in Delhi", Transport Policy, vol. 56, 2017
14. Lakshay & N. Bolia, "Network Redesign for Efficient Crowd Flow and Evacuation During Mass Gatherings", Applied Mathematical Modelling, vol. 53, 2018, 251-266
15. V. Chauhan, H. Suman & N. Bolia, “Binary Logistic Model for Cannibalization Estimates of Mode Shift into Delhi Metro”. The Open Transportation Journal. vol. 10, 2016, 124 – 136
16. Lakshay, A. Agarwal & N. Bolia, “Route Guidance Map for Emergency Evacuation”, Journal of Risk Analysis and Crisis Response, vol. 6 (3), 2016, 135-144
17. R. N. Rai & N. Bolia, “Throughput analysis of the Overhaul Line of a Repair Depot”. International Journal of Services and Operations Management, vol 25(4), 2016, 459-78
18. H. Suman, N. Bolia, & G. Tiwari, “An Analysis of the Factors Influencing the Use of Public Buses in Delhi”, Journal of Urban Planning and Development, vol 142 (3), 2015, p.04016003
19. R. N. Rai & N. Bolia, “Modified FMEA model with Repair Effectiveness Factor using Generalized Renewal Process”, SRESA Journal of Life Cycle Reliability and Safety Engineering, vol. 4(3), 2015, 36-46
20. M. Tanwar & N. Bolia, “Maintenance Modelling using Generalized Renewal Process for Sequential Imperfect Corrective and Preventive Maintenance”, International Journal of Performability Engineering, vol. 11(5), 2015, 427-442

21. A. Upadhyay & N. Bolia, “An Optimization based Decision Support System for Integrated Planning and Scheduling on Dedicated Freight Corridors”, International Journal of Production Research, vol. 52(24), 2014, 7416-7435
22. A. Upadhyay & N. Bolia, “Combined Empty and Loaded Train Scheduling for Dedicated Freight Railway Corridors”, Computers & Industrial Engineering, vol. 76, 2014, 23-31
23. R. N. Rai & N. Bolia, “Optimal Decision Support for Air Power Potential”, IEEE Transactions on Engineering Management, vol. 61 (2), 2014, 310-322
24. R. N. Rai & N. Bolia, “Availability Based Optimal Maintenance Policies for Repairable Systems in Military Aviation by Identification of Dominant Failure Modes”, Journal of Risk and Reliability [Proceedings of the Inst. of Mech. Engineers, Part O], vol. 228(1), 2014, 52-61
25. M. Tanwar, R. N. Rai & N. Bolia, “Imperfect Repair Modeling Using Kijima Type Generalized Renewal Process”, Reliability Engineering & System Safety, vol. 124, 2014, 24-31
26. R. N. Rai & N. Bolia, “Availability based Methodologies for Optimal Maintenance Policies in Military Aviation”, International Journal of Performability Engineering, vol. 10(6), 2014, 641-648.
27. N. Bolia & R. N. Rai, “Reliability Based Methodologies for Optimal Maintenance Policies in Military Aviation”, International Journal of Performability Engineering, vol. 9(3), 295-303, 2013
28. N. Bolia & V. Kulkarni, “Index policies for resource allocation in wireless networks”, IEEE Transactions on Vehicular Technology, vol. 58, 1823–1835, 2009
29. N. Bolia & V. Kulkarni, “Monotonicity of Optimal Scheduling Policies for Wireless Cellular Data Networks”, Int’l J. of Comm., Network and System Sciences, vol. 5 (10), 671-677, 2013
30. J. Bhandari & N. Bolia, “User Scheduling in Cognitive Radio Networks”, Journal of Computations and Modelling, vol. 3 (3), 2013, 177-193
31. M. Vig, N. Bolia & G. Sundararaman, "Optimization of Milk-Run of JCB India Ltd. (Ballabhgarh Plant)", Journal for Traffic and Logistics Engineering, vol 1 (2), 2013, 137-140.
32. E. Michael Foster, Serhan Ziya, Nomesh Bolia & Michael Hosking, “Rehabilitation and Juvenile Justice Policy: A Mathematical Modeling Approach”, Mathematical Modeling and Applied Computing, vol. 3 (1), 2012, 71-91.
33. N. Bolia, J. Bhandari & P. Saxena, “Quantification of Agility of a Supply Chain using Fuzzy Logic”, International Journal of Management, IT and Engg, vol. 2 (3), 2012, 141-159.
34. N. Bolia & S. Juneja, “Monte Carlo Methods for Pricing Financial Options”. *Sadhana*, 30, 2005, 347-386
35. P. Gupta & N. Bolia, “Applications of Dynamic Network Flow in Evacuation Planning”, accepted in Asian Journal of Environment and Disaster Management
36. N. Bolia & V. Kulkarni, “Scheduling Policies in a Cellular Network with Data Queuing for Users”, accepted in Journal of Computations and Modelling
37. Lakshay & N. Bolia, "Robust Scheduling for Bus Based Evacuation Planning", Under 3rd review at Socio-Economic Planning Sciences
38. K. Kala & N. Bolia, “Analysis of Citizen's Perception towards Segregation and Composting”, Under review at Environment, Development and Sustainability
39. Kaveri Kala, Nomesh B. Bolia, Sushil, “Citizen Concerns and Outreach for Municipal Solid Waste Management Communication Policies”, Under review at Journal of Policy Modeling
40. Lakshay & N. Bolia, “Efficient Evacuation Strategies for Emergency Response Management”, Under review at Natural Hazards Review
41. R. Gadepalli, G. Tiwari & N. Bolia, “Integrated and Demand Responsive Transit Frequency Optimisation in multi-modal transit environments with both formal and informal systems”, under review at Public Transport
42. A. Bhatnagar & N. Bolia, “A Comparison of Mathematical Models for School Consolidation Policy”, Under review at Applied Spatial Analysis and Policy

43. P. Sen & N. Bolia, “Policy towards Industry 4.0: Enablers and Barriers Analysis for Environmentally Conscious Supply Chain and Product Development”, Under review at International Journal on Production Economics
44. D. Gautam & N. Bolia, “Air Pollution: Impact & Interventions”, Under review at Air Quality, Atmosphere & Health
45. Kaveri Kala, N. Bolia & Sushil, “Effects of Socio-Economic Factors on Quantity and Type of Municipal Solid Waste”, Under review at Environmental Monitoring and Assessment
46. A. Bhatnagar, A. Jain & N. Bolia, " Analysis of factors affecting school performance in Delhi, India’, Under review at The Urban Review
47. K. Agrawal, H. Suman & N. Bolia, “Frequency Optimization Models for Reducing Overcrowding Discomfort”, Under review at Transportation Research Record
48. M. Tanwar & N. Bolia, “Multiple human error servicing modes in imperfect maintenance: Risk management through modified 3-D HESMEA”, under review at Human Factors: The Journal of the Human Factors and Ergonomics Society

PEER REVIEWED INTERNATIONAL CONFERENCES

1. M. Gupta & N. Bolia, “Measurement of Efficiency of Indian Courts using Data Envelopment Analysis”, OR61 (Annual Conference of the OR Society), September 2019, Canterbury, UK
2. K. Kala & N. Bolia, “Analysis of Citizen Response and Incentives for Waste Management”, 30th European Conference on Operational research, June 2019, Dublin, Ireland
3. Gadepalli, R., Tiwari, G. & Bolia, N, “Integrated Planning and Frequency Optimisation of bus and paratransit services in Indian cities”, World Conference on Transport Research (WCTR) Young Researchers Conference, May 2019, Mumbai, India
4. Bakshi, N.D., Tiwari, G. & Bolia, N.B.,”Urban Freight Trip estimation using Count Data Models”, 15th World Conference on Transport Research, May 2019, Mumbai, India
5. Bakshi, N.D., Tiwari, G. & Bolia, N.B., “Motorised and Non Motorised Urban Freight TripAttraction Patterns in Developing Economies”, 15thWorld Conference on Transport Research, May 2019, Mumbai, India
6. A. Bhatnagar & N. Bolia, “Governance of school system through relocation planning using GIS locations”, OR60, Lancaster, UK, September 2018
7. A. Bhatnagar & N. Bolia, “Redistribution of Teachers in the Indian School System”, 51st Annual Convention of the Operational Research Society of India & International Conference (ORSI 2018), IIT Bombay, December 2018
8. R. Gadepalli, G. Tiwari & N. Bolia, “Integrated transit frequency optimisation in multi-modal transit environments with bus and paratransit systems: Case study of Visakhapatnam, India”, Conference on Advanced Systems in Public Transport (CASPT), Brisbane, Australia, July 2018
9. R. Gadepalli, G. Tiwari & N. Bolia, “Integrated Public Transport Operations Planning in Developing Countries: Analysis of Travel Demand Characteristics and Operational Efficiency of Bus and Paratransit Services in Visakhapatnam, India”, Brisbane, Australia, July 2018 (accepted)
10. N. D. Bakshi, G. Tiwari & N. Bolia, “Influence of Urban form on Urban Freight Trip Generation”, CODATU XVII Conference, Hyderabad, India, November 2017
11. A. Bhatnagar & N. Bolia, "Mathematical Modelling For School Consolidation", INFORMS Annual Meeting, Houston, Texas, October 2017
12. Lakshay & N. Bolia, “Operating Strategies for Bus-Based Evacuation Planning”, IFORS 2017, Quebec, Canada, July 2017
13. H. Suman, & N. Bolia, “Addressing Overcrowding of Buses in Delhi.”, OR58 Annual conference of the Operational Research Society, held in Portsmouth, UK, September 2016
14. H. Suman & N. Bolia, “Bus Bunching Modeling for Mixed Traffic in Delhi”, INFORMS Annual meeting 2015, Philadelphia (PA), USA, November 2015

15. H. Suman & N. Bolia, “Bus Frequency Optimization Under Mixed Traffic Condition for Delhi”, 27th European Conference on Operational Research, Scotland, UK, July 2015
16. H. Suman, N. Bolia & G. Tiwari, “User Profile, Trip Profile, and Perception of Bus Commuters in Delhi, India”, Transportation Research Board 94th Annual Meeting (No. 15-0538), Washington DC, USA, January 2015
17. A. Upadhyay & N. Bolia, “IP Model for Planning Accompanied Combined Transport Operations in India”, 20th International conference of International Federation of Operational Research Societies, Barcelona, Spain, July 2014
18. N. Bolia & V. Kulkarni, “Admission Policies for Walk-in Patients at a Diagnostic Clinic”, 20th Conference of International Federation of Operational Research Societies, Barcelona, Spain, July 2014
19. M.Tanwar & N. Bolia, "Reliability Analysis of Human Error Servicing in imperfect locomotive maintenance", Proceedings of International Conference on EuroMaintenance 2014, Helsinki, Finland, 2014, 510-15
20. N. Bakshi & N. Bolia, “Analysis of adoption and impact of delivery restrictions on reducing fatality and improving average speed in Delhi”, International Symposium on Transportation Planning and Safety, New Delhi, India, December 2015
21. H. Suman, N. Bolia & G. Tiwari, “Safety and Security Perceptions Amongst Captive and Non-captive Users of Public Bus Transport” International Symposium on Transportation Planning and Safety, New Delhi, India, December 2015
22. H. Suman, N. Bolia & G. Tiwari, “Impact of Demand Management Interventions on Behaviour of Non-Captive Bus Users.” 10th Annual International Conference on Public Policy and Management, Indian Institute of Management Bangalore, India, August 2015
23. Lakshay & N. Bolia, “Risk management strategies to avoid stampede at Mass gatherings” In proceedings of the Second World Congress on Disaster Management (2nd WCDM: Session 7), Vishakhapatnam, November 2015; http://www.wcdm.info/sessionplan
24. H. Suman, N. Bolia & G. Tiwari, “Incentivization of Public Transport in Delhi (India)” Virtual poster presentation in VREF fall 2014 workshop held at Columbia University and Ford Foundation in New York, USA, 26-30th October 2014
25. N. Bolia, “A Markov Model for Throughput Maximization in CR Network”, International Conference on Electrical Engineering and Computer Science, Tokyo, Japan, March 2013
26. N. Bolia, “Reaching Out to the Rural Indian: A Novel Way to Approach Public Health Delivery”, Seventh International Conference on E-Governance, Bangalore, India, April 2010
27. N. Bolia, J. Bhandari & P. Saxena, “Fuzzy Logic based Performance Evaluation of Supply Chains”, INFORMS Annual Meeting, Austin, TX, USA, November 2010
28. N. Bolia & V. Kulkarni, “An Index Policy for Scheduling Users in a Wireless Cell”, INFORMS Annual Meeting, Washington, DC, USA, October 2008
29. N. Bolia & V. Kulkarni, “Index Policies for Resource Allocation in Wireless Networks”, Ninth INFORMS Telecommunications Conference, Washington DC, USA, March 2008
30. N. Bolia, P. Glasserman & S. Juneja, “Function-Approximation-based Importance Sampling for Pricing American Options”, Florida, USA, December 2004, Boo, IEEE Press, 604-611
31. N. Bolia & S. Juneja. Function-Approximation Based Perfect Control Variates to Price American Options. Florida, USA, 2005, Proceedings of the 2005 Winter Simulation Conference, IEEE Press, 1876-1883

SELECTED OUTREACH AND POPULAR MEDIA OPEDS

1. N. Bolia & M. Khare, “A passage to clean air”, Indian Express, https://indianexpress.com/article/opinion/columns/a-passage-to-clean-air/

2. S. Mathur & N. Bolia, “Twenty million cases still pending: In India’s district courts, a crisis is revealed”, IndiaSpend and First Post, https://www.firstpost.com/india/twenty-million-cases-still-pending-in-indias-district-courts-a-crisis-is-revealed-2712890.html
3. N. Bolia & A. Singh, “Solid Waste Management Rules 2016: How well they have been implemented on ground”, Indian Express, https://indianexpress.com/article/what-is/solid-waste-management-rules-2016-how-well-they-have-been-implemented-on-ground/
4. N. Bolia & K. Jain, “How efficient is Indian education”, LiveMint, https://www.livemint.com/Opinion/5De0NZEOAgwHV5zOYCtWNP/How-efficient-is-Indian-education.html
5. S. Mathur & N. Bolia, “Worst Year Ever For MGNREGA, 23% Drop In Assets Created”, Business World, http://www.businessworld.in/article/Worst-Year-Ever-For-MGNREGA-23-Drop-In-Assets-Created/29-04-2016-97507/
6. S. Mathur & N. Bolia, “The MGNREGA Index”, The Hindu, https://www.thehindu.com/opinion/op-ed/the-mgnrega-index/article8668701.ece
7. N. Bolia & S. Aggarwal, “What Teachers Must Learn”, Indian Express, https://indianexpress.com/article/opinion/columns/what-teachers-must-learn/