

## EXPERIENCE

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- Mar 2021 – Present – **Indian Institute of Technology Madras, India**, *Assistant Professor*  
Building Technology and Construction Management division, Department of Civil Engineering
- Aug 2020 – Mar 2021 – **Indian Institute of Technology Madras, India**, *Visiting Faculty*  
Building Technology and Construction Management division, Department of Civil Engineering
- Apr 2020 – May 2020 – **The University of Tokyo**, *Post-Doctoral research scholar*  
Construction Management and Infrastructure Systems Laboratory, The University of Tokyo
- Jun 2019 – Mar 2020 – **Asian Development Bank Institute, Tokyo**, *Research Associate*  
Capacity Building and Training Department for Sanitation and High-Speed Railway
- Jul 2018 – Sep 2018 – **Asian Development Bank Institute, Tokyo**, *Internship*  
Capacity Building and Training Department for Sanitation and High-Speed Railway
- Feb 2015 – Mar 2015 – **Indian Institute of Technology Kanpur, India**, *Project Associate*  
Creating International Program for Sustainable Infrastructure Development
- Jun 2013– Jan 2015 – **Fractal Analytics, India**, *Senior Business Analyst*  
Data Harmonization. Awarded ‘Good Samaritan’
- May 2012 – Jul 2012 – **Vakil Mehta Sheth Consulting Engineers, India**, *Internship*  
Structural design of high-rise buildings
- Jun 2011 – **Delhi Metro Rail Corporation Limited, India**, *Internship*

## RESEARCH PROJECTS

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1. **PI**, “Piloting A Multi-Attribute Urban Sensing Technology for Sustainable Cities: Assessing Urban Metabolism, Form, Activities and Emissions at Fine Scales”, National Science Foundation (NSF) - Ministry of Electronics and Information Technology (MeitY). Oct 24 - Ongoing.
2. **Co-PI**, “A2-P1: Decision Support System for Water Resource Management (Development of a Small Rivers Management Tool (SRMT) for Holistic Water Resources Management in India)”, National Mission for Clear Ganga. Oct 24 - Ongoing.
3. **PI**, “A LIDAR scanning integrated with GIS technology to optimize the Construction and Demolition waste supply chain for urban areas in India”, Ministry of Education, June 23 – Ongoing
4. **PI**, “Assessment of occupational risk of Indoor Air Quality on Construction sites and evaluation of an outdoor air filtration system”, CSR project from Trident Pneumatics Private Limited, Mar 24 - Ongoing.
5. **PI**, “GIAN course on System-thinking based Integrated Risk-Management of mega-projects: A case of High-Speed Railway in India”, Ministry of Education, Completed.
6. **Co-PI**, “Technologies for Low Carbon and Lean Construction”, A Center of Excellence at IIT Madras, Funded through: Institute of Eminence scheme of Ministry of Education, Completed.
7. **PI**, “Case-study for Asian Development Bank Institute (ADBI) on Adoption of Building-Information Modelling (BIM) for National Capital Region Transport Corporation Limited, India” Agency: Asian Development Bank Institute, Completed.
8. **PI**, “Computer-Vision enabled Assessment of Work-related Musculoskeletal Disorders (WMSDs) for Sanitation Workers in India”, Agency: Exploratory Research Grant of IIT Madras, Completed.
9. **PI**, “Construction and Demolition (C&D) Waste Management and the role of the Informal Unorganized Sector in India: Case of New Delhi”, Agency: CSR funds of IIT Madras, Completed.
10. **PI**, “Basic Study for Safety and Accessibility of Transport Sector in ASEAN-India Region”, Agency: Oriental Consultants India, Completed.

11. **PI**, “Policy Maker E-Training Program on Principles of Developing Quality Infrastructure in Asia”, Agency: Asian Development Bank Institute, Completed.

## PATENTS

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1. **Bugalia, N.**, Ha, Q., Jaiswal, A. “A MOBILE OR WEB APPLICATION FOR A LOCALIZED CONSTRUCTION AND DEMOLITION WASTE TRACING SYSTEM” filed for Provisional Patent, Indian Patent. 2025

## LIST OF PUBLICATIONS

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### Journal Papers

1. Jaiswal, A., Jha, K., **Bugalia, N.**, Ha, Q., “Vision-based volumetric estimation of localized construction and demolition waste”, [Waste Management](#). Accepted for publication. Vol. 206, 115046, 2025.
2. Patka, A., **Bugalia, N.**, Mahalingam, A., “Effectiveness of Virtual Reality (VR) in Construction Quality Training: A Comparative Study”, [Journal of Construction Engineering and Management \(ASCE\)](#), Vol. 151(10), 2025.
3. Wani, S., Agarwal, I., **Bugalia, N.**, Kandasami, R K. “Predicting the performance of slurry TBM through marine deposits using machine learning models”, [Automation in Construction](#), Vol. 177, 106308, 2025.
4. Bhattacharjee, K., **Bugalia, N.**, Mahalingam, A., “Differences in Pathways to Resilient Safety Culture for Construction Projects of Different Sizes”, [Journal of Construction Engineering and Management \(ASCE\)](#), Vol. 151 (5), 2025.
5. Bhattacharjee, K., Chaudhary, S., Vishnoi, A., Patel, D.A., **Bugalia, N.** “Characterization of health and safety hazards of deconstruction activities” [American Journal of Industrial Medicine](#), Vol. 68, 2024.
6. Jadhav, S., Selvam, M., Zunain, S., **Bugalia, N.** “Evaluating External Generalizability of Machine Learning Models for Recycled Aggregate Concrete Property Prediction” [Journal of Cleaner Production](#). Vol. 469, 143166, 2024.
7. Bhattacharjee, K., **Bugalia, N.**, Mahalingam, A., “An analysis of safety practices for small, medium, and large construction projects: A resilience engineering perspective”, [Safety Science](#), vol. 169, 106330, 2024.
8. **Bugalia, N.**, Memura, Y., Dasari, R., & Patidar, M., “A system dynamics model for effective management strategies of High-Speed Railway (HSR) projects involving private sector participation,” [Transportation Research Part A : Policy and Practice](#), vol. 175, 103779, 2023
9. Gadekar, H., **Bugalia, N.**, “Automatic classification of construction safety reports using semi-supervised YAKE-Guided LDA approach,” [Advanced Engineering Informatics](#), vol. 56, 101929, 2023.
10. **Bugalia, N.**, Tarani, V., Kedia, J., and Gadekar, H., “Machine learning-based automated classification of worker-reported safety reports in construction,” [Journal of Information Technology in Construction \(ITcon\)](#), Vol. 27 (45), 926-950, 2022.
11. **Bugalia, N.**, Choudhury, S.R, Maemura, Y., and Seetharam, KE., “A Systems Theoretic Process Analysis (STPA) approach for analyzing the governance structure of Faecal Sludge Management (FSM) in Japan,” [Environment and Planning B: Urban Analytics and City Science](#), 2022.
12. **Bugalia, N.**, Maemura, Y., and Ozawa, K., “Characteristics of enhanced safety coordination between high-speed rail operators and manufacturers,” [Reliability Engineering and System Safety](#), vol. 216, 107995, 2021.
13. **Bugalia, N.**, Maemura, Y., and Ozawa, K., “A system dynamics model for near-miss reporting in complex systems,” [Safety Science](#), vol. 142, 105368, 2021.
14. **Bugalia, N.**, Maemura, Y., and Ozawa, K., “Organizational and institutional factors affecting High-Speed Rail safety in Japan,” [Safety Science](#), vol. 128, 104762, 2020.
15. **Bugalia, N.**, Maemura, Y., and Ozawa, K., “Demand risk management of private High-Speed Rail operators: A review of experiences in Japan and Taiwan,” [Transport Policy](#), 2019. Available Online.
16. **Bugalia, N.**, and Maekawa, K, “Time-Dependent Capacity of Large Scale Deep Beams under Sustained Loads,” [Journal of Advanced Concrete Technology](#), vol. 15, 2017, pp. 314-327.

## Books

1. **Bugalia, N.**, Misra, S., Mahalingam, A., and Seetharam, K.E., “Policy Messages for Planning and Implementing High-Speed Rail in Asia”, [Asian Development Bank Institute](#), 2022

## Case Studies

1. Jayaram, S., Bhattacharjee, K., **Bugalia, N.**, and Mahalingam, A., “Adoption of Digital Technology at Scale: The Case of India’s Digital Evolution”, [Asian Development Bank Institute](#), 2024

## Book Chapters

1. **Bugalia, N.**, Maemura, Y., and Ozawa, K., “Top Management Decisions and Safety Culture,” in Handbook on High-Speed Rail and Quality of Life. Asian Development Bank Institute, Mar 2020.
2. Kumamoto, Y., and **Bugalia, N.**, “Safety and Reliability,” in Handbook on High-Speed Rail and Quality of Life. Asian Development Bank Institute, Mar 2020.
3. Mukoyama, M., and **Bugalia, N.**, “Salient features of Human Resources Development,” in Handbook on High-Speed Rail and Quality of Life. Asian Development Bank Institute, Mar 2020.

## Conference Papers

1. Jaiswal, A., **Bugalia, N.**, Ha, Q., “Optimizing Structure from Motion Parameters for Volume Estimation of Construction and Demolition Waste”, in the *Annual International Symposium on Automation and Robotics in Construction (ISARC)*, 2025. <https://doi.org/10.22260/ISARC2025/0127>
2. SKS, **Bugalia N.**, Raphael, B. “REBAPose -A Computer vision based Musculoskeletal Disorder Risk Assessment Framework” in the *Annual International Symposium on Automation and Robotics in Construction (ISARC)*, 2024. <https://doi.org/10.22260/ISARC2024/0079>
3. Bhattacharjee, K., **Bugalia, N.**, “Do Projects of Different Sizes Face Differences in Safety-Critical Complexities? Empirical Evidence from Implications for the Construction Sector of India”, *Construction Research Congress*, 2024. <https://doi.org/10.1061/9780784485293.047>
4. Srinija, S., **Bugalia, N.**, “Evaluation of System Dynamics-Based Serious Games for Teaching Project Management Concepts in Construction”, *Construction Research Congress*, 2024. <https://doi.org/10.1061/9780784485293.001>
5. Jaiswal, A., Roy, P., **Bugalia, N.**, Varghese, K., Ha, Q., “Framework to identify directions for future construction and demolition waste management technologies”, *E3S Web of Conferences*, 2024. <https://doi.org/10.1051/e3sconf/202449604005>
6. Nevatia A, Saha S, Bhagavatula SB, **Bugalia N.**, “A pre-trained language model-based framework for deduplication of construction safety newspaper articles,” in *Annual International Symposium on Automation and Robotics in Construction (ISARC)*, 2023. <https://doi.org/10.22260/ISARC2023/0053>
7. Gadekar H, **Bugalia N.**, “YAKE-Guided LDA approach for automatic Classification of construction safety reports,” in *Annual International Symposium on Automation and Robotics in Construction (ISARC)*, 2022. [10.22260/ISARC2022/0062](https://doi.org/10.22260/ISARC2022/0062)
8. **Bugalia N.**, Dasari, R. “A System Dynamics model for identifying stakeholder coordination strategies for managing PPPs in High-Speed Railway”, *2022 System Dynamics Annual Conference*
9. **Bugalia N.**, Maemura, Y. “System dynamics study of interactions between interpersonal bonding and reporting culture for High-Speed Railway organizations, *2022 System Dynamics Annual Conference*
10. **Bugalia, N.**, Chaurasia, R., “Aspects of Systems-Thinking for Railway Safety in India: A Literature Review”, 6<sup>th</sup> Conference of Transportation Research Group of India, December 2021.
11. **Bugalia, N.**, Choudhury, S.R, Maemura, Y., and Seetharam, KE., “A Systems Theoretic Process Analysis (STPA) approach for analyzing the governance structure of Faecal Sludge Management (FSM) in Japan,” Virtual Workshop on Water and Sanitation, 2021.

12. Kedia, J., Tarani, V., **Bugalia, N.**, and Mahalingam, A. “Classification of safety observation reports from a construction site: An evaluation of text mining approaches”, The 6th PMI Research and Academic Virtual Conference 2021.
13. **Bugalia, N.**, Maemura, Y., and Ozawa, K., “Safety Improvement Strategies for Future Railway Systems,” International Railway Safety Conference, 2020 (presented on 21st October 2020).
14. **Bugalia, N.**, Maemura, Y., and Ozawa, K., “Interorganizational coordination and Safety: Operator-Manufacturer relationships in the High-Speed Railway industry,” Local Proceedings of 20th International Conference on Group Decision and Negotiation, 2020
15. **Bugalia, N.**, Maemura, Y., and Ozawa, K., “Towards Proactive Safety Management of Shinkansen,” Proceedings of 12th International Symposium of SSMS 2019, 3725, Tokyo, Sep. 17-18, 2019.
16. **Bugalia, N.**, Maemura, Y., and Ozawa, K., “Demand risk management of Private High-Speed Rail operators: A review of experiences in Japan and Taiwan,” World Conference on Transport Research, Mumbai, May 26-31, 2019. (Recommended to and published in Transport Policy thereafter)
17. **Bugalia, N.**, Maemura, Y., and Ozawa, K., “Safety Culture in High-Speed Railways and the Importance of Top Management Decisions,” Conference on Spillover Effects of High-Speed Rail and Quality of Life, ADBI, Tokyo, November 14-15, 2018. (Published as the Book-Chapter thereafter)

### Policy Notes and Briefs

1. **Bugalia, N.**, Misra, S., Mahalingam, A., Seetharam, K.E., “Lessons from Global Experiences on High-Speed Rail Implementation”, [Policy Note](#), Asian Development Bank Institute, 2021.
2. Oo, P., **Bugalia, N.**, Seetharam, K.E., Ikeda, T., Koike, T., “Frontiers of Water-Related Disaster Management and the Way Forward,” [Policy Brief](#), Asian Development Bank Institute, August 2020.
3. **Bugalia N.**, Yamamoto S., Kim C.J., and Seetharam, K.E., “Revisiting the Public-Private Partnership for rapid progress on Sanitation SDGs,” [Policy Brief](#), Asian Development Bank Institute, May 2020.
4. Seetharam, K.E., Hashimoto, K., and **Bugalia, N.**, “Institutional Mechanisms for Sustainable Sanitation: Learning from Successful Case Studies,” [Policy Brief](#), Asian Development Bank Institute, 2018.

### Short Research Blogs

1. **Bugalia, N.**, Seetharam K.E., “Thinking beyond the suitability of high-speed railway in India,” Asia Pathways, Oct. 2019.
2. **Bugalia, N.**, Seetharam K.E., “Delivering safety for high-speed rail,” Asia Pathways, Aug. 2019.
3. **Bugalia, N.**, Seetharam K.E., “High-Speed Rail: necessary but not sufficient for socio-economic development,” Asia Pathways, Feb. 2019.
4. **Bugalia, N.**, Kelkar, V., Seetharam K.E., “No matter how poor you are, there is always a way to improve sanitation,” Asia Pathways, Nov. 2018.
5. **Bugalia, N.**, ““Theory of change” as a solution to the global sanitation crisis,” Asia Pathways, Oct. 2018.
6. **Bugalia, N.**, “Composite Water Management Index: A pathway to solve the water crisis in India,” Asia Pathways, Aug. 2018.
7. **Bugalia, N.**, ““Commitment” as a success factor for fecal sludge management,” Asia Pathways, Aug. 2018.

### HONORS AND AWARDS

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- Young Faculty Recognition Award (YFRA), Indian Institute of Technology Madras, 2025
- Two-time recipient of the prestigious *MEXT scholarship* from the Japanese Government
- Received **Good Samaritan – team player award**, 2014, Fractal Analytics
- Awarded **Academic Excellence Award** from the Director IIT-Kanpur for the year 2011-12

### EDUCATION

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Apr 2017 – **Ph.D., Civil Engineering, The University of Tokyo, Japan. GPA: 4.0/4.0**  
Mar 2020 *Title : Challenges and Improvement for Safety Management Practices at the Organizational and Institutional levels in Japanese High-Speed Railways, Advisor : Dr. Kazumasa Ozawa*

### **Diploma in Global Leader Program for Social Design and Management**

Apr 2015 – **Masters, Civil Engineering, The University of Tokyo, Japan. GPA: 3.8/4.0**  
Mar 2017 *Title: Time-Dependent shear capacity of RC beams under statistically sustained loading, Advisor : Dr. Koichi Maekawa*

Jul 2009 – **B.Tech, Civil Engineering, Indian Institute of Technology Kanpur, India. GPA: 9.0/10**  
May 2013

## **TEACHING EXPERIENCE**

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2023-2024 **System Dynamics Modelling for Circular Economy**, IIT Madras, India  
2021-2025 **Construction Economics and Finance (CE6030)**, IIT Madras, India  
2020-2024 **Construction Quality and Safety Management (CE5130)**, IIT Madras, India  
2023-2025 **Certificate program on Construction Technology and Management**, IIT Madras, India  
2019-2020 **Executive Program**, Teaching Assistant, National Graduate Institute for Policy Studies, Japan  
*Financing Infrastructure Projects, for about 25 professionals*  
2018-2019 **Construction and Project Management**, Guest Lecturer, Saitama University, Japan  
Apr 2018 **Case Study of International Projects**, Teaching assistant, The University of Tokyo, Japan  
2015- 2016 **Materials Laboratory**, Teaching Assistant, The University of Tokyo, Japan

## **PROFESSIONAL RESPONSIBILITIES**

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- Advisory Panel, Global Safety Evidence Center, [Llyod's Research Foundation](#), since Dec 2025
- Grant Proposal Reviewer, Global Safety Evidence Center, Llyod's Research Foundation, Jan 2026
- Track Chair, International Symposium on Automation and Robotics in Construction (ISARC), 2023, 2024
- **Secretary, Special Interest Group**, titled "High-Speed Rail: Policy, Investments, and Impacts" for the World Conference on Transport Research Society, since June 2019
- **Journals Reviewed – 50+ reviews for more than 10 journals.**  
Journal of Construction Engineering & Management (ASCE), Safety Science, Automation in Construction, Reliability Engineering and System Safety, Journal of Information Technology in Construction, Transportation Research Record, Engineering Project Journal, System Dynamics Society annual conference.

### **Professional Memberships**

- International Council For Research and Innovation in Building and Construction (CIB) W099 – Safety, Health & Wellbeing in Construction, W107 – Construction in Developing Countries, W123 – People in Construction (Since November 2025)
- American Society of Civil Engineering (ASCE) (Since February 2024)

### **Conferences Organized**

- Closed-Door Roundtable on Occupational Health and Safety (OHS) for Construction in India, December 2024, NIT Surat and IIT Madras.
- The adoption of digital technology in construction, July 2024, IIT Madras
- International Symposium on Automation and Robotics in Construction, July 2023, IIT Madras
- ADBI-JARTS-IIT learning series for High-Speed Railway Webinar Series, Asian Development Bank Institute, 2021.
- ADBI-ICHARM Policy Dialogue on Water-Related Disaster Resilience Under Climate Change, 27-28 January 2020, Tokyo, Japan
- Distinguished Seminar Series, 12 September 2019, Tokyo, Japan
- Business Leaders' Policy Dialogue on Accelerating Sanitation for All, 30 August 2019, Tokyo, Japan
- Development Partner Roundtable and Policy Dialogue on Sustainable Sanitation in Asia, 20-22 September 2018, Tokyo, Japan
- ADBI Special sessions on High-Speed Rail in WCTR, May 2029, Mumbai

**Lead Executive**, Pan IIT, India-Japan Convention 2017, Tokyo (200 participants) December 2017

**President**, International Student Association for Civil engineers, UTokyo Aug 2015 - Jul 2016

- Led a team of 5 members to plan and execute yearlong activities for about 100 international students, including a field trip, and the annual symposium; edited the annual magazine

## STUDENT GUIDANCE

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Type (Till Jan 2026)	Completed	Ongoing
Post-Doc	0	4
Ph.D	1	4
M.S	1	0
M.Tech	29	3
B.Tech	12	2

## PROFESSIONAL TRAININGS

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**Global Leader Program for Social Design and Management** Apr 2017 - Mar 2020

- Developed the problem-forming and problem-solving ability for real-world complex challenges by leveraging specialized and broad-spectrum knowledge from a global perspective

**The Role of Public Policy in Infrastructure Development Program**, ADBI and Leadership Academy for Development, Stanford University, 23-28 June 2019, Tokyo.

**High-Speed Railway Summer Seminar for International Students**, GRIPS, Tokyo, 5-7 September 2016