

Dr. Abhijith. G. R.

Assistant Professor

Department of Civil Engineering

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RESEARCH AND TEACHING EXPERIENCE

- **Assistant Professor:** Department of Civil Engineering, BITS Pilani Hyderabad Campus, Hyderabad, India (March 2023 – August 2023)
- **Post Doctoral Researcher:** Faculty of Civil and Environmental Engineering, Technion – Israel Institute of Technology, Haifa, Israel (September 2020 – March 2023)
- **Pre-Post Doctoral Researcher:** Department of Civil Engineering, Indian Institute of Technology Madras, Chennai, India (March 2020 – August 2020)

PROFESSIONAL ACTIVITIES

- **Member:** Water Distribution Systems Analysis (WDSA) Committee, American Society of Civil Engineers (ASCE) – May 2023
- **Guest Editor:** Water Journal Special Issue: Water Distribution System Quality Analysis and Control – February 2023
- **Associate Editor:** Journal of Water Resources Planning and Management – November 2022
- **Affiliated Member:** American Society of Civil Engineers (ASCE) – November 2022

EDUCATION

- **Ph. D. Environmental Engineering:** Indian Institute of Technology Madras, Chennai, India (Graduated in 2020)
- **Master of Technology, Environmental Engineering:** Visvesvaraya National Institute of Technology, Nagpur, India (Graduated with Gold Medal in 2015)
- **Bachelors in technology, Civil Engineering:** College of Engineering Trivandrum India under the University of Kerala, India (Graduated in 2013)

SCHOLASTIC ACHIEVEMENTS

- **Second Place in the Graduate Student Paper competition by the ASCE Environmental and Water Resources Institute:** Ivo D., Kadinski L., Abhijith G. R., Ostfeld A., and Cominola A. 2023. "A machine learning-based surrogate model for coupled hydraulic and water quality simulation in water distribution networks. EWRI Conference, Henderson Nevada, USA., May 21-24.
- Awarded the **Honors Fellowship** in 2022 for getting selected as an **Exceptional Post Doc student** from Faculty of Civil and Environmental Engineering of Technion – Israel Institute of Technology, Haifa, Israel.

- Awarded the **pre-post-Doctoral Fellowship** (for six months from March – August 2020) by the Indian Institute of Technology Madras for the academic/ research performance during Ph. D program.
- **Selected as a candidate from India in attending the Government of Taiwan-sponsored international workshop** on “Promoting Sustainable Protection and Restoration of Soil, Groundwater and Water Environment” at National Cheng Kung University (NCKU), Tainan City, Taiwan in January 2019.
- Awarded the **Institute medal** and **Shri Bhide Memorial Prize** for securing highest CGPA in M Tech Environmental Engineering from VNIT, Nagpur concluded in spring 2015.
- Received the **Purna Award –I** and **Academic Excellence Prize** for securing the first position in the order of merit in M Tech Environmental Engineering from VNIT, Nagpur concluded in spring 2015.
- Awarded the **Late. Prof. P. R. Bhawe Prize** for exhibiting the best performance in the subject “Environmental Systems Optimization” of M Tech 1st year Environmental Engineering program of VNIT Nagpur in the year 2013-14.

THESIS DETAILS

Ph.D.: Mesoscale Modelling of Contaminant Transport in Water Distribution Systems

Masters: Leakage as Pressure-dependent demands in Optimal Design of Water Distribution Networks

Bachelors: Comparison of mechanical properties and fiber reinforced and non-fiber reinforced High Strength Concrete

RESEARCH INTERESTS

- Monitoring and controlling water quality in drinking water supply systems.
- Developing advanced modelling tools for water distribution systems analysis.
- Managing water quality risks associated with intermittent water supply operation.
- Improving the reliability and equity of water supply in rural and urban settings.
- Developing cost-effective disinfection alternatives for drinking water.
- Designing water treatment technologies for natural organic matter removal.

JOURNAL PUBLICATIONS

21. **Abhijith, G. R.**, and Ostfeld, A. 2023. Assessing uncertainties in mechanistic modeling of quality fluctuations in drinking water distribution systems. *ASCE Journal of Environmental Engineering* (*Accepted for publication*).
20. **Abhijith, G. R.**, Naidu, M. N., Boindala, S. P., Vasan, A., and Ostfeld, A. 2023. Analyzing the role of consumer behavior in coping with intermittent supply in water distribution systems. *Journal of Hydroinformatics*, 25(5), 1766–1787.
19. **Abhijith, G. R.**, Salomons, E., and Ostfeld, A. 2023. Developing a simplified practical approach for analyzing the criticality of isolation valves. *ASCE Journal of Water Resources Planning and Management*, 149(11), 06023005.
18. Ostfeld, A and **Abhijith, G. R.** 2023. Digital Twin for Water Distribution Systems Management—Towards a Paradigm Shift. *ASCE Journal of Pipeline Systems Engineering and Practice Forum*, 14(3), 02523001.
17. Raimondi, A., Quinn, R., **Abhijith, G. R.**, Becciu, G., and Ostfeld, A. 2023. Rainwater Harvesting and Treatment: state of the art and perspectives. *Water, SI Rainwater Harvesting and Treatment*, 15(8), 1518.

16. **Abhijith, G. R.**, Salomons, E., and Ostfeld, A. 2022. Reliability of a Contamination-Detection Sensor Network in Water Distribution Systems during a Cyber-Physical Attack. *Water*, 14(22), 3669.
15. Price, E., **Abhijith, G. R.**, and Ostfeld, A. 2022. Pressure management in water distribution systems through PRVs optimal placement and settings. *Water Research*, 226, 119236.
14. **Abhijith, G. R.**, and Ostfeld, A. 2022. Flexible decision-making framework for developing operation protocol for water distribution systems. *Journal of Environmental Management*, 320, 115817.
13. **Abhijith, G. R.**, and Ostfeld, A. 2022. Contaminant Fate and Transport Modeling in Distribution Systems: EPANET-C. *Water*, 14(10), 1665.
12. **Abhijith, G. R.**, and Ostfeld, A. 2022. Making Waves: Applying Systems Biology Principles in Water Distribution Systems Engineering. *Water Research*, 219, 118527.
11. **Abhijith, G. R.**, and Ostfeld, A. 2022. Examining the longitudinal dispersion of solutes inside water distribution systems. *ASCE Journal of Water Resources Planning and Management*, 148(6), 04022022
10. Mohan, S., and **Abhijith, G. R.** 2021. Closure to "Hydraulic Analysis of Intermittent Water-Distribution Networks Considering Partial-Flow Regimes" by S. Mohan and G. R. Abhijith. *ASCE Journal of Water Resources Planning and Management*, 147(11), 07021019.
9. **Abhijith, G. R.**, and Ostfeld, A. 2021. Model-based investigation of the formation, transmission, and health risk of perfluorooctanoic acid, a member of PFASs group, in drinking water distribution systems. *Water Research*, 204, 117626.
8. **Abhijith, G. R.**, and Ostfeld, A. 2021. Modeling the response of non-chlorinated, chlorinated, and chloraminated water distribution systems towards arsenic contamination. *ASCE Journal of Environmental Engineering*, 147(10), 04021045.
7. **Abhijith, G. R.**, and Ostfeld, A. 2021. Modeling the Formation and Propagation of 2,4,6-trichloroanisole, a Dominant Taste and Odor Compound, in Water Distribution Systems. *Water*, 13(5), 638.
6. **Abhijith, G. R.**, Kadinski, L., and Ostfeld, A. 2021. Modeling Bacterial Regrowth and Trihalomethane Formation in Water Distribution Systems. *Water*, 13(4), 463.
5. **Abhijith, G. R.**, and Mohan, S. 2021. Cellular Automata-based Mechanistic Model for Analyzing Microbial Regrowth and Trihalomethanes Formation in Water Distribution Systems. *ASCE Journal of Environmental Engineering*, 147(1), 04020145.
4. Mohan, S., and **Abhijith, G. R.** 2020. Hydraulic Analysis of Intermittent Water Distribution Networks considering Partial Flow Regimes. *ASCE Journal of Water Resources Planning and Management*, 146(8), 04020071.
3. **Abhijith, G. R.**, and Mohan, S. 2020. Random Walk Particle Tracking embedded Cellular Automata model for predicting temporospatial variations of chlorine in water distribution systems. *Environmental Processes*, 7(1), 271-296.
2. Mohan, S., **Abhijith, G. R.**, and Aneesh, B. 2018. Modeling chlorine response to uncontrolled contamination events in drinking water distribution systems. *Journal of Water Supply Research and Technology – AQUA*, 67(8), 834-845.
1. Gupta, R., **Abhijith, G. R.**, and Ormsbee, L. 2016. Leakage as Pressure-Driven Demand in Design of Water Distribution Networks. *ASCE Journal of Water Resources Planning and Management*, 142(6), 1-14.

CONFERENCE PROCEEDINGS

18. **Abhijith G. R.**, Ivo, D., Cominola, A., and Ostfeld, A. 2023. Hybrid mechanistic and machine learning-based modeling approach for predicting quality fluctuations in drinking

- water distribution systems. 19th International Computing & Control for the Water Industry Conference, Leicester, UK., September 4-7.
17. **Abhijith, G. R.** and Ostfeld, A. 2023. Introducing EPyT-C: An independent Python-based water quality modeling extension for EPANET. 19th International Computing & Control for the Water Industry Conference, Leicester, UK., September 4-7.
 16. **Abhijith, G. R.**, Leonidou, N., Dräger, A., and Ostfeld, A. 2023. Exploring the cause-effects of quality fluctuations in drinking water distribution systems by applying systems biology approaches. 19th International Computing & Control for the Water Industry Conference, Leicester, UK., September 4-7.
 15. **Abhijith, G. R.** and Ostfeld, A. 2023. Redefined entropy index for water distribution systems analysis. 19th International Computing & Control for the Water Industry Conference, Leicester, UK., September 4-7.
 14. **Abhijith, G. R.**, Naidu, M. N., Boindala, S. P., Vasan, A., and Ostfeld, A. 2023. Exploring the consumer behaviour in water supply systems with uncertain and irregular intermittency. 19th International Computing & Control for the Water Industry Conference, Leicester, UK., September 4-7.
 13. **Abhijith, G. R.** and Ostfeld, A. 2023. Inferring the stochasticity associated with modeling the biological stability of drinking water within distribution networks. In: World Environmental and Water Resources Congress 2023: Adaptive Planning and Design in an Age of Risk and Uncertainty, Henderson Nevada, USA., May 21-24.
 12. **Abhijith, G. R.**, Salomons, E., and Ostfeld, A. 2023. Enhancing the reliability of a contamination detection sensors network in water distribution systems during a cyber-attack. In: World Environmental and Water Resources Congress 2023: Adaptive Planning and Design in an Age of Risk and Uncertainty, Henderson Nevada, USA., May 21-24.
 11. **Abhijith, G. R.**, Steffelbauer, D., and Ostfeld, A. 2023. Towards digital twins for emerging contaminants in water distribution systems. In: World Environmental and Water Resources Congress 2023: Adaptive Planning and Design in an Age of Risk and Uncertainty, Henderson Nevada, USA., May 21-24.
 10. Ivo, D., Kadinski, L., **Abhijith, G. R.**, Ostfeld, A., and Cominola, A. 2023. A machine learning-based surrogate model for coupled hydraulic and water quality simulation in water distribution networks. In: World Environmental and Water Resources Congress 2023: Adaptive Planning and Design in an Age of Risk and Uncertainty, Henderson Nevada, USA., May 21-24.
 9. Schuster, J., Kadinski, L., Hao, C., **Abhijith, G. R.**, Grieb, A., Pu, L., Ostfeld, A., and Ernst, M. 2022. Online monitoring and digital control in drinking water distribution systems. In: German-Israeli Cooperation in Water Technology Research Status Seminar, Ashdod, Israel, October 25-27.
 8. Kadinski, L., Schuster, J., **Abhijith, G. R.**, Hao, C., Grieb, A., Pu, L., Ernst, M., and Ostfeld, A. 2022. Machine learning methodologies to predict possible water quality anomalies as a support tool for online monitoring of organic parameters. WDSA/CCWI Joint Conference, Valencia, Spain, July 18-22.
 7. **Abhijith, G. R.** and Ostfeld, A. 2022. Appraisal of the Position of Water Distribution Systems as a PFAS Exposure Pathway. In: World Environmental and Water Resources Congress 2022, Atlanta, GA, USA.
 6. **Abhijith, G. R.** and Ostfeld, A. 2022. EPANET-C—An Umbrella Simulation Tool for Water Distribution System Quality Analysis. In: World Environmental and Water Resources Congress 2022, Atlanta, GA, USA.
 5. Kadinski, L., Schuster, J., **Abhijith, G. R.**, Hao, C., Grieb, A., Pu, L., Ernst, M., and Ostfeld, A. 2022. Establishing an Experimental and Simulation Interface for Online Monitoring and

Modeling of Bacterial Growth in Water Distribution Systems. In: World Environmental and Water Resources Congress 2022, Atlanta, GA, USA.

4. Hao, C., Schuster, J., Kadinski, L., **Abhijith, G. R.**, Grieb, A., Ernst, M., Ostfeld, A., and Pu, L. 2022. Optimal control of chlorine concentration in water distribution system. In: World Environmental and Water Resources Congress 2022, Atlanta, GA, USA.
3. Schuster, J., Kadinski, L., Hao, C., **Abhijith, G. R.**, Grieb, A., Pu, L., Ostfeld, A., and Ernst, M. 2022. Real-time monitoring and controlling of water quality in water distribution networks based on flow cytometry and fluorescence spectroscopy. In: World Environmental and Water Resources Congress 2022, Atlanta, GA, USA.
2. Mohan, S. and **Abhijith, G. R.** 2019. Modelling the effects of intermittent water supply on quality deterioration in terms of disinfection by-products formation. In: 11th World Congress on Water Resources and Environment, Madrid, Spain.
1. Gupta, R., **Abhijith, G. R.**, and Ormsbee, L. 2015. Including Leakage as Pressure Driven Demands in Optimal Design of Water Distribution Networks. In: Water Resources Management in a Changing World: Challenges and opportunities. Istanbul, Turkey.

CONFERENCE PRESENTATIONS (WITH ABSTRACT ONLY)

4. **Abhijith G. R.** and Ostfeld A. 2022. Post-treatment PFAS contamination of drinking water. WDSA/CCWI22 WDSA/CCWI Joint Conference, Valencia, 18-22 July 2022 Spain.
3. Mohan, S. and **Abhijith, G. R.** 2019. Microbial Regrowth Dynamics in Intermittent Water Supply systems – A Modeling Investigation. In: Water and Development Congress and Exhibition, Colombo, Sri Lanka.
2. **Abhijith. G. R.** and Mohan, S. 2018. An Innovative Protocol for Chlorine Sensors to monitor the Biological Quality of Drinking Water Distribution Systems. In: Sustainable Technologies for Intelligent Water Management, Roorkee, India.
1. **Abhijith, G. R.** Aneesh, B. and Mohan, S. 2016. Modeling Microbial Contaminant Transport in Water Distribution Systems. In: National Conf. on Energy and Environment. Coimbatore, India.

SUBMITTED PAPERS TO JOURNALS

2. **Abhijith, G. R.** and Ostfeld, A. EPyT-C: A Python package for water quality modeling in water distribution systems. Journal of Open Source Software (*Under Review*).
1. **Abhijith, G. R.** and Mohan, S. Discussion of "Analysis of Intermittent Water Distribution Networks Using a Dummy Emitter Device at Each Demand Node" by C. R. Suribabu and P. Sivakumar. ASCE Journal of Pipeline Systems Engineering and Practice (*Under Review*).

SEMINARS, WORKSHOPS AND COLLOQUIUMS

- Delivered a guest Lecture on "Purification of drinking water on a large scale", in the Suchitra Academy International School, Hyderabad on 19 April, 2023.
- Participated and presented a paper on "An Investigation on to the Effects of Intermittent Supply Operation on Urban Water Quality", in the International Water Association supported International Conference on "Industrial water, energy and Environment" from 25 - 26 January, 2019, organized by CODISSIA, Coimbatore, India.
- Participated as a **selected candidate from India** in the International workshop on "Promoting Sustainable Protection and Restoration of Soil, Groundwater and Water Environment" from January 13 to 20, 2019 at National Cheng Kung University (NCKU), Tainan City, Taiwan.

- Participated and presented a paper on "Increasing the Operational Reliability of Intermittent Drinking Water Distribution Systems through Intelligent Source Point Management", in the National Conference on "Sustainable Technologies for Intelligent Water and Environmental Management" 22 - 23 March, 2018, organized by Annamalai University, India.
- Participated and presented a paper on "An Innovative Protocol for Chlorine Sensors to monitor the Biological Quality of Drinking Water Distribution Systems", in the International Conference on "Sustainable Technologies for Intelligent Water Management" 16 - 19 February, 2018, organized by IIT Roorkee, India.
- Participated in the 'Training Program on Flood Inundation Modelling and Water quality prediction Modelling for Chennai, India' organized by United Nations University – institute for the Advanced Studies of Sustainability, Tokyo and IIT Madras, Chennai on 6-8 December 2017.
- Participated and delivered an expert talk in "Research Colloquium on Environmental and Water Resources Engineering" November, 2017, organized by Department of Civil Engineering, NIT Calicut, Calicut, India.
- Attended the National Workshop on "Water and Wastewater- Sustainable Management." 27-28 March, 2017, organized by CSIR-NEERI, Nagpur and CSIR-NEERI, Chennai, TamilNadu, India.
- Participated in the National Workshop on "Water Resources System Modeling." 9-10 March, 2017, organized by the Centre for Water Resources, Anna University, Chennai, TamilNadu, India.
- Participated and delivered an expert talk in "Research Colloquium on Environmental and Water Resources Engineering" 22 October, 2016, organized under TEQIP-II by Department of Civil Engineering, Rajiv Gandhi Institute of Technology, Kottayam, Kerala, India.
- Attended Workshop on "Environmental Systems Modeling." 8-10 January, 2015, organized under TEQIP-II by Visvesvaraya National Institute of Technology, Nagpur.

TECHNICAL EXPERIENCES

- Part of the German-Israeli collaborative project (MoDiCon) aiming to develop technologies for digital monitoring and control of water quality in water distribution systems from September 2020.
- Part (IIT Madras under the supervision of Dr. S Mohan) of the UNDP supported project on "National Inventory of Mercury releases in India" from November 2018 to August 2020.
- Worked with Dr. S Mohan, Professor, Department of Civil Engineering, IIT Madras in the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) supported project on the setting up of 3.5 MLD Capacity Common Wastewater Treatment Plant at Patparganj Industrial Area of Delhi from July 2018 to February 2019.
- Worked with Dr. S Mohan, Professor, Department of Civil Engineering, IIT Madras for studying the technical feasibility of constructing a 'Dedicated water supply scheme for Madurai corporation from the Lower Camp of Mullaiperiyar river' from September 2018.
- Worked with Dr. S Mohan, Professor, Department of Civil Engineering, IIT Madras for studying the feasibility of 'Disposal of textile waste salt in the hazardous waste management facility of TamilNadu Waste Management Ltd., Gummidipoondi, India' from April 2018 to August 2020.
- Worked with Dr. S Mohan, Professor, Department of Civil Engineering, IIT Madras for conducting 'Gap analysis and Environmental audit of the altered effluent discharge

system of Daimler India Commercial Vehicles Pvt. Ltd., Oragadam, India' from April 2018 to July 2018.

- Worked with Dr. S Mohan, Professor, Department of Civil Engineering, IIT Madras for conducting 'Environmental audit conducted at Sterling Biotech Limited, Ooty, India' from February 2018 to March 2018.
- Worked with Dr. Rajesh Gupta, Professor, Department of Civil Engineering, VNIT Nagpur for the 'design of a new water distribution system for the campus of Visvesvaraya National Institute of Technology, Nagpur, India' from October 2014 to January 2015.

STUDENTS

- **Ms. Raghad Shamaly (from July 2023):** M. Sc, " Systems Biology for Water Quality Networks", Primary advisor - Prof. Avi Ostfeld, Technion Israel Institute of Technology, Haifa, Israel.

PERSONAL INFORMATION

- Date of Birth 20th May 1992
- Marital status Married (Renju S Francis) with a daughter (Jala R Abhijith)
- Permenant address Chandramangalathu Puthen Veedu, Assemblimukku, Kudavoor PO, Trivandrum - 695 313, Kerala, India.