Curriculum Vitae

Swati Sirsant (PhD, Water Resources Engineering Specialization)
Department of Civil Engineering, Indian Institute of Technology Bombay, Powai- 400076, Mumbai, India
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Academic Record

Examination	University	Institute	Year	CPI/ %
Doctorate	IIT Bombay	IIT Bombay	2021	9.27
M.Tech	NIT	Visveswaraya National Institute of Technology, Nagpur	2015	9.94
B.E.	CSVTU	Bhilai Institute of Technology, Durg	2013	8.92
12th Board	CBSE	Vishwadeep Sr. Sec. School, Durg	2009	77.4 %
10th Board	CBSE	Vishwadeep Sr. Sec. School, Durg	2007	93.6 %

Technical Skills

PhD project: Multi-objective design of Water Distribution Networks considering hydraulic, mechanical failures and future water demands. (July 2015- Ongoing)
Supervisor: Dr. M. Janga Reddy, Department of Civil Engineering, IIT Bombay, Powai- 400076, Maharashtra, India

- Applied and tested Self-Adaptive Differential Evolution (SADE) Algorithm for the problem of deterministic and reliability-based design of water distribution networks (WDNs)
- Applied Multi-objective SADE (MOSADE) for the problem of multi-objective design of WDNs
- Developed a novel reliability surrogate measure, CERI (combined entropy resiliency index) which serves as a robust index to be used as a substitute for both hydraulic and mechanical reliabilities to be used for multi-objective design of WDNs
- Developed and applied a hybrid MOSADE-DP algorithm for the problem of WDN expansion considering future changes in water demand.
- **Research contributions**: Published **5 international journals** and **7 conference proceedings.**

M.Tech Project: Development of a decentralized water management plan for Raipur City using Spatial Analysis (2013-2015)
Supervisor: Dr. Y.B. Katpatal, Department of Civil Engineering, VNIT Nagpur, 440010, Maharashtra, India

- Generated thematic maps for factors that affect reservoir location such as land use/land cover, topography and proximity to drainages in GIS environment
- Performed overlay analysis using thematic maps generated for land use/land cover, topography and proximity to drainages to determine the suitable reservoir locations
- Estimated the water demand for the area by digitizing the built-up area to generate the population count
- Determined the water availability using discharge available from rivers using G&D data, runoff from the watersheds using SCS-CN method, and water available from roof-top rainwater harvesting by digitizing the roof tops using ArcGIS software
- Determined the reservoir capacity knowing the water demand and availability of the area.
- **Research contributions**: Published **1 international conference papers**.

Teaching Assistant (TA) duties: Undertook academic TA duties for the 6 semesters from July 2016- July 2019 at IIT Bombay.

- Served as the laboratory TA of undergraduate and post graduate students from Civil Engineering Department for Hydraulics and Fluid Mechanics Laboratory.
- Performed the course TA duty for the undergraduate course, named, 'Water Resources Engineering", and advanced master's course 'Water Resources Systems".

Seminars/ Talks

- Paper presentation on '**Reliability-based design of water distribution networks considering mechanical failures'** at the 10th World Congress of the European Water Resources Association (EWRA2017) "Panta Rhei", Athens, Greece, 5-9 July, 2017. (Paper published online)
- Paper presentation on '**Examining resiliency and entropy as surrogate measures for hydraulic reliability**

estimation of water distribution networks' in the *22nd International Conference on Sustainable Technologies for Intelligent Water Management (STIWM)* held at IIT Roorkee, India. February 16-19.

- Paper presentation on '**Multi-Objective Self-Adaptive Differential Evolution Algorithm for design of water distribution networks'** in '*22nd International Conference on Hydraulics, Water Resources and Coastal Engineering (HYDRO 2017)* held at LD Engineering College, Ahmedabad, India. December 21-23.
- Paper presentation on '**Reliability assessment of water distribution networks accounting for pipe failure'** at *21st International Conference on Hydraulics, Water Resources and Coastal Engineering (HYDRO 2016)* held at CWPRS Pune, India. December 8-10.
- Paper presentation on '**Entropy as a Surrogate Measure for Water Distribution Network Reliability considering Extended Period Simulations'** in the *Conference on Next Frontiers in Civil Engineering: Sustainable and Resilient Infrastructures (NFiCE 2018)* organised by IIT Bombay, India. November 30 – December 1
- Paper presentation on '**Multi-Objective Design of Water Distribution Networks using Resiliency as Reliability Surrogate'** in the *National Seminar of IWWA on 'Innovative Water and Sewage Water Practices in Urban Environment'* held at IIT Bombay, India. January 20-21.
- Paper presentation on '**Determining optimal location of isolation valves using self-adaptive differential evolution algorithm'** in the *49th Annual Convention of IWWA on 'Smart Water Management'* held at VNIT Nagpur, India. January 19-21
- Paper presentation on '**Determination of Adequate Reservoir Locations and Operation Using Spatial Approach'** in *77th EAGE Conference and Exhibition 2015* (Vol. 2015, No. 1, pp. 1-5) organized by European Association of Geoscientists & Engineers, held at Madrid, Spain. https://doi.org/10.3997/2214-4609.201413403

Research Interests

- Water Distribution Network design.
- Reliability estimation and reliability surrogate measures.
- Application of Evolutionary Algorithms.

Civil Engineering Expertise

- Simulation packages acquainted with: **MATLAB, EPANET, WATERGEMS, ArcGIS, ERDAS Imagine, Python**
- Programming Languages: C, C++
- Key courses: Water Resources Systems, Water Resources Engineering, Engineering Hydrology

Journal Publications

- **Sirsant S**. and Janga Reddy M. (2021). "Optimal Design of Pipe Networks Accounting for Future Demands and Phased Expansion using Integrated Dynamic Programming and Differential Evolution Approach". *Water Resources Management*. 1-20, https://doi.org/10.1007/s11269-021-02777-8. (I.F. 2.924)
- **Sirsant S**. and Janga Reddy M. (2020). "Assessing the Performance of Surrogate Measures for Water Distribution Network Reliability". *Journal of Water Resources Planning and Management*. *DOI: 10.1061/(ASCE)WR.1943-5452.0001244*. (I.F. 3.404)
- **Sirsant S**. and Janga Reddy M. (2018). "Reliability based design of water distribution networks using self-adaptive differential evolution algorithm". *ISH Journal of Hydraulic Engineering*, 24(2), 198-212. https://doi.org/10.1080/09715010.2017.1408038. (I.F. 1.040)
- **Sirsant,** S., and Reddy, M. J. (2018). SaDE algorithm for reliability-based design of water distribution networks. *Water Utility Journal*, 19: 59-70.
- Sirsant S. and Reddy M. J. (2017). "Reliability-based design of water distribution networks considering mechanical failures". *European Water*, Vol. 58, 407-414.

Extra-Curricular Activities and Awards

- Hold Sangeet Visharad in Hindustani Classical Vocals
- Participated in the national level singing competitions organized by Kerala Samajam and got many prices for classical, semi classical and folk singing.
- Participated in Durg idol in the year 2009 and secured 3rd position.
- Participated and successfully completed 1 hour marathon at IIT Bombay.
- Participated in inter hostel band competition at IIT Bombay named "Goonj" and secured the best singer award.

References:

1. Dr. Manne Janga Reddy, Department of Civil Engineering (Associate Professor, IIT Bombay)	Email: mjreddy@civil.iitb.ac.in Contact: +91 (22) 2576 7320
2. Dr. Y.B. Katpatal, Department of Civil Engineering, (Professor, VNIT Nagpur)	Email: ybkatpatal@rediffmail.com Contact: +91-712-2801083

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