



SUNIL KUMAR

PhD, IIT Gandhinagar

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EDUCATION

Duration	Degree/Certificate	College/School	CGPA (10)/%
July 2024 - Present	Ph.D. Civil Engineering (Hydraulics)	IIT Gandhinagar	10.0
July 2014 - August 2018	B.Tech (Civil Engineering)	IIT Patna	7.57
May 2011 - June 2013	Senior Secondary Examination	RBSE	88.80
May 2009 - May 2011	Secondary Examination	RBSE	88.50

PUBLICATIONS

- [1] I. M. Tripathi, **S. Kumar**, A. Modi, A. M. Bhat, C. Bhagat, P. K. Mohapatra, and M. L. Kansal, "Towards Water Sensitivity: A Critical Review of Urban Water Management Strategies," *Water Resources Management*, 2025, (accepted).

DOCTORAL THESIS

Numerical Simulation of Vortex Drop Shaft Hydrodynamics under Multiphase Flow Conditions

(Supervisor: Prof. Pranab K. Mohapatra)

Proposal Defended: Oct 8, 2025

- Research Scope:** Numerical and experimental investigation of vortex drop shafts using tangential inlet designs.
- Methodology:** Utilizing Computational Fluid Dynamics (CFD) to model complex multiphase flow conditions.
- Experimental Validation:** Designing a physical experimental setup in the hydraulics laboratory using tangential inlets to validate numerical models.
- Coursework:** Applied Hydraulic Transients, Advanced Hydraulic Engineering, Advanced Engineering Hydrology, Microwave Remote Sensing.

EXPERIENCE

- Junior Research Fellow (JRF), cNarmada Project, IIT Gandhinagar** *July 2024 – Present*
 - Developing an integrated river basin management plan for the Narmada River.
- Graduate Teaching Fellow (GTF) IIT Gandhinagar, Gujarat, India** *August 2025 – November 2025*
 - Conducted tutorials and guided 39 M.Tech students in a PG writing course.
- Teaching Assistant (TA) IIT Gandhinagar, Gujarat, India** *January 2025 – April 2025*
 - Assisted with the undergraduate Fluid Mechanics course for 2nd and 3rd year B.Tech students.
- Junior Research Fellow (JRF) Water4Change Project, IIT Gandhinagar** *Sept 2022 - July 2024*
 - Contributed to an Indo-Dutch initiative for urban water challenges in India.
- Summer Internship NWR Jaipur, India** *May 2017 – July 2017*
 - Conducted a study on managing performance in shed installation and initial steps of railway track construction.

RESEARCH & PROJECTS

- Numerical Simulation of Vortex Drop Shaft Hydrodynamics, IIT Gandhinagar** *Ongoing*
 - Investigating the complex fluid dynamics of vortex drop shafts using experimental methods and advanced numerical modeling (CFD).
 - Modeling multiphase flow in vortex drop shafts to analyze flow behavior and efficiency.
- Ground Response Analysis of Soil Deposit, IIT Patna** *July 2017 - May 2018*
 - Analyzed the ground response of soil deposits at the IIT Patna campus under the guidance of Dr. Amarnath Hegde.

- Observed how response parameters like Peak Ground Acceleration (PGA) and maximum shear strain are affected by variations in input motion and shear wave velocity.
- **Steel and Reinforced Concrete Design Projects, IIT Patna** *Sept 2016 - April 2017*
 - Designed an industrial steel shed for a manufacturing unit using ETABS under Dr. Vaibhav Singhal.
 - Executed the design of a reinforced concrete structure for a three-story framed residential building using SAP2000.
- **Sociology of Development Project, IIT Patna** *Jan 2017 - April 2017*
 - Conducted a water quality check in the nearby area of the IIT Patna campus to assess environmental conditions.

TECHNICAL SKILLS

- **Software & Simulation:** FLOW-3D, FLOW-3D HYDRO, HEC-RAS, ANSYS Fluent, DeepSoil, SAP2000, ETABS.
- **Design & GIS:** AutoCAD Civil 3D, AutoCAD 2D Drafting, QGIS, ArcGIS, QSWAT.
- **Programming:** Python, MATLAB, Java, C/C++, LaTeX.
- **Laboratory & Surveying:** Vetrino+ (ADV), Dumpy Level, Auto Level, Theodolite, Total Station.

ACHIEVEMENTS & AWARDS

- **Inspire Scholarship:** Awarded by the Department of Science & Technology, Government of India.
- **MCM Scholarship:** Awarded Merit-cum-Means Scholarship two times during undergraduate studies.
- **Competition Rank:** Secured 1st rank in Hydraulic Arm designing competition.
- **State Award:** Awarded with a Laptop by the Rajasthan Government for academic excellence.

REFERENCES

Dr. Pranab K. Mohapatra

Professor
IIT Gandhinagar, India
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Dr. Amarnath Hegde

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Dr. Vaibhav Singhal

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