

Hydropower Potential | Structural Engineering | Civil Engineering | 5 Publications | 2 Book Chapters

Education	University	Year	%/CGPI	Achievement
PhD	IIT Roorkee	2021	9.857	
M.Tech (Structural Engg.)	NIT Hamirpur	2015	9.18	Gold Medal
B.Tech (Civil Engg.)	Uttarakhand Technical University	2013	85.1	Gold Medal
12th	Doon Cambridge School	2009	64	
10 th	Doon Cambridge School	2007	74	

Academic Projects

Jan. 2022 to June 2023

I. Monitoring Hydro-abrasive erosion and suspended sediment for optimal operation of Hydropower plant

- Continuous measurement of suspended sediment concentration and particle size distribution along with quantification of shape and mineral composition of suspended sediment at a hydropower plant.
- Analysis of hydro-abrasive erosion accurately via. 3D scanning for finding the critical portions of the turbine components

II. Preparation of Detailed Project Report of proposed Kurm Sarovar Lake & Deepteshwar Lake in Chamapawat District, Uttarakhand

III. Review of Detailed Project Report of Denzi & Papum Hydroelectric power plant (each 2 X 5 MW), Arunachal Pradesh.

Doctoral Area of Research

July 2016 to Dec. 2021

[Guide: Prof. Sunil Kumar Singal, Department of Hydro and Renewable energy, IIT Roorkee]

Thesis Title: Development of Model for Potential Assessment of Hydrokinetic Energy

- Hydropower potential Assessment of Static (conventional scheme) and Kinetic (Hydrokinetic technology) schemes.
- Hydrokinetic Technology: Site selection, Device selection, Design of Hydro kinetic turbine, Wake recovery distance determination, Resource Assessment.
- Rotor's performance (TSR vs Efficiency Curve- characteristic curve) via. Model testing and CFD analysis.
- Techno-Economic Analysis of Hydrokinetic Technology.

Post Graduation Research Work

July 2016 to Dec. 2021

- Wind Load Calculation as per IS 875 Part-3.
- Determination of pressure distribution coefficients due to wind load on high rise building via. CFD analysis.
- Impact of wind on different side ratio of high rise building.

Awards

- G M NAWATHE PURUSKAR by ISH (Indian Society for Hydraulics) Executive Council of India for the Best Paper in Hydro- 2019 International for the year 2020
- SPEAKER AT INTERNATIONAL WORKSHOP on Hydrokinetic Technology held on 10th – 11th Oct. 2019 and delivered a talk on Potential Assessment of Hydrokinetic Energy.
- GOLD MEDALIST: Branch Topper in M.Tech batch 20013-15.
- GOLD MEDALIST: Branch Topper in B.Tech batch 2009-2013.
- SETH ROSHAN LAL JAIN Trophy Winner: College Topper Batch 2009-2013.

Technical Skills

C, C++, AutoCAD, ANSYS- WORKBENCH (CFD)

Research Publications

I. Journals

- M. Sood and S. K. Singal, "Development of statistical relationship for the potential assessment of hydrokinetic technology", in Ocean Engineering, Elsevier, 2022, [10.1016/j.oceaneng.2022.112140](https://doi.org/10.1016/j.oceaneng.2022.112140)
- M. Sood and S. K. Singal, "A numerical analysis to determine wake recovery distance for the longitudinal arrangement of hydrokinetic turbine in the channel system", in Energy Sources Part A: Recovery, Utilization, and Environmental Effects, Taylor and Francis, 2021 [10.1080/15567036.2021.1979695](https://doi.org/10.1080/15567036.2021.1979695)
- M. Sood and S. K. Singal, "Development of hydrokinetic energy technology: A review", in International Journal of Energy Research, Wiley, 2019. [10.1002/er.4529](https://doi.org/10.1002/er.4529)
- S.K. Verma, A.K. Roy, S. Lather, M. Sood, "CFD simulation for wind load on octagonal tall buildings", in Int J Eng Trends Technology, 2015. [10.14445/22315381/ijett-v24p239](https://doi.org/10.14445/22315381/ijett-v24p239)
- S.K. Singal, Vishal Gupta and M Sood, "A Numerical Study to Determine the Impact of Trash Rack Blockage on Head Loss", in Water and Energy International, CBIP, 65(7), 2022.

II. Book Chapter

- Chapter 43, M. Sood and S. K. Singal, "Investigation of two phase numerical modeling considering free surface effect for operating hydrokinetic turbine in an open channel," in 2nd International Conference on Advances in Mechanical and Systems Engineering, July 17-19, 2021, Recent Advances in Mechanical Engineering, Lecture Notes in Mechanical Engineering (LNME), Springer. [10.1007/978-981-19-2188-9_43](https://doi.org/10.1007/978-981-19-2188-9_43)
- Manoj Sood, Upendra Bajpai and Sunil Kumar Singal, "Performance Investigation of hydrokinetic Savonius rotor operating at different alignment", Proceedings of the 9th International and 49th National Conference on Fluid Mechanics and Fluid Power (FMFP), December 14-16, 2022, IIT Roorkee, A Springer book series Lecture Notes in Mechanical Engineering [In Press]

III. Magazine Article

- S. K. Singal and M. Sood, "A New Approach of Small Hydropower: Hydrokinetic Technology," Energy Future—The Energy Magazine by The Energy and Resources Institute (TERI), New Delhi, pp. 29–33, June-2020.

IV. Conference

- S. K. Singal and M. Sood, "A numerical study to analyse the influence of blockage ratio on the performance of hydrokinetic turbine" Fossils & Renewables (F&R) Energy 6th International Conference, Feb 15-17, 2022. (Virtual)
- M. Sood and S. K. Singal, "A numerical study to analyze the lateral distance between hydrokinetic turbine in a canal: A case study," in Roorkee Water Conclave 2020, February 26-28, 2020, Indian Institute of Technology Roorkee.
- M. Sood and S. K. Singal, "Challenges in the development of Hydrokinetic Technology," in HYDRO 2019-International Conference (Hydraulics, Water Resource & Coastal Engineering), December 18-20, 2019. Osmania University, Hyderabad, India.

V. Reports

- S.K Singal, A. Kumar, M. Sood, N. Arora, "Monitoring Hydro-abrasive erosion and suspended sediment for optimal operation of Hydropower plant", Baira Siul Hydro Power Plant Chamba, Himachal Pradesh, NHPC.
- S.K Singal, A. Kumar, S.K. Prajapati, D.K. Agarwal, R. Chalisgaonkar, M. Sood, "Detailed Project Report for Kurm Sarovar Lake, Block & Distt. Champawat, Uttarakhand", Irrigation Department, Uttarakhand.
- S.K Singal, A. Kumar, S.K. Prajapati, D.K. Agarwal, R. Chalisgaonkar, M. Sood, "Detailed Project Report for Deepteshwar Lake, Block & Distt. Champawat, Uttarakhand", Irrigation Department, Uttarakhand.