Dr. Saurabh Vijay

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RESEARCH PROFILE

Dr. Saurabh Vijay is an Assistant Professor in Geospatial Engineering, Department of Civil Engineering, Indian Institute of Technology Roorkee, India. His research lies at the interface of remote sensing, glaciology, geodesy, and Earth surface deformation, with emphasis on glacier dynamics, glacial lakes, cryospheric hazards, and land-surface change in the Himalaya and polar regions. His work integrates satellite remote sensing, Synthetic Aperture Radar Interferometry (InSAR), GIS, and field observations to develop repeatable and observation-driven frameworks for process understanding and hazard assessment. He also uses time-series InSAR to study land deformation in the Himalaya.

ACADEMIC METRICS

Google Scholar Citations	795
h-index	12
i10-index	13
Research Areas	Remote Sensing; InSAR; GIS; Earth Surface Deformation; Glaciology; Geodesy

PROFESSIONAL APPOINTMENTS

Assistant Professor, Department of Civil Engineering, IIT Roorkee, India	*Dec 2020 - Present*
Research Associate, Byrd Polar & Climate Research Center, USA	*Jun 2019 - Dec 2020*
Postdoctoral Researcher, DTU Space, Technical University of Denmark, Denmark	*Apr 2017 - May 2019*
Lecturer, Jaipur Engineering College, Jaipur, India	*Aug 2008 - Jul 2010*

EDUCATION

Ph.D., Friedrich-Alexander University Erlangen-Nurnberg (FAU), Germany	*2017*
M.Tech., Geomatics Engineering, Indian Institute of Technology Roorkee, India	*2012*
B.E., Electronics and Communication Engineering, University of Rajasthan, Jaipur, India	*2008*

HONORS, AWARDS, AND RECOGNITION

- Member, Technical Advisory Committee for the Monitoring of Glaciers, NIH Roorkee (2024 onward)
- Member, Review Panel of the 43rd, 44th and 45th Indian Scientific Expedition to Antarctica (2023-2025)
- Council Member, International Glaciological Society (2023-2026)
- Outstanding Student Presentation Award, EGU General Assembly, Austria (2015)
- IIT Master Sandwich Scholarship, DAAD, Germany (2011)
- MHRD Fellowship, Government of India (2010)

SPONSORED RESEARCH PROJECTS

Development of a Satellite Remote Sensing-Based Glacial Lake Monitoring System: Dashboard Implementation and Training Program *Approved*

Principal Investigator. Funding amount: Rs. 96.00 lakhs.

Seasonal Ice Velocity and Grounding Line Fluctuations in Antarctica using NISAR data *2026-2029*
Principal Investigator | Indian Space Research Organization (ISRO). Funding amount: Rs. 35.66 lakhs.

21st cEnTury Evolution of small glaciers and their impact on regioNAL hydrology in the HIMalayas (ETERNALHIMA) *2023-2027*
Principal Investigator | Ministry of Earth Sciences and Swiss National Science Foundation. Project value: Rs. 139.73 lakhs (IIT Roorkee share: Rs. 87.28 lakhs); ongoing.

Interlinked seasonal evolution of supraglacial lakes and ice velocity changes in Greenland *2022-2025*
Principal Investigator | ISRO (STC IIT Roorkee). Funding amount: Rs. 24.18 lakhs; completed.

High-resolution observation of glacier ice velocity, topography, terminus and surface features of an Indian Himalayan Glacier *2022-2024*
Principal Investigator | Faculty Initiation Grant, IIT Roorkee. Funding amount: Rs. 20.00 lakhs.

Classification of glacier changes in the Indian state of Uttarakhand *2021*
Principal Investigator | Bavarian Indian Center, Germany. Funding amount: Rs. 2.16 lakhs; completed.

Identifying current and future GLOF risk over contrasting topographic and climate zones of Indian Himalaya using earth observation data and modeling *2022-2025*
Co-Principal Investigator | Ministry of Earth Sciences and Swiss National Science Foundation. Project value: Rs. 91.72 lakhs (IIT Roorkee share: Rs. 18.62 lakhs); completed.

RESEARCH GUIDANCE AND STUDENT SUPERVISION

Ph.D. Scholars

- Pawan Singh - Glacier monitoring using observation and modeling (2021-ongoing)
- Ravindra Kumar - Monitoring of glacial lakes and glacial lake outburst disasters using observation and modeling (2021-ongoing)
- Sarvesh Kumar Verma - Improving observations of small glaciers in the Himalayas using in-situ and remote sensing techniques (2021-ongoing); Co-supervisor: Dr. Argha Banerjee, IISER Pune
- Deepak Kumar Verma - Structural deformation and risk analysis using observation and modeling (2022-ongoing)
- Gopika Das K - Ice dynamics and evolution of supraglacial lakes in Greenland (2023-ongoing)
- Prankur Sharma - Snow water equivalent using remote sensing and field techniques (2023-ongoing)
- Sapna Azad - Ice dynamics of Antarctic Ice Sheet using remote sensing (2023-ongoing); Co-supervisor: Dr. Vikram Goel, NCPOR Goa
- Yamini Agarwal - Multi-temporal analysis of crevasse evolution, calving processes and ice discharge patterns in lake-terminating glaciers of Himalayas (2024-ongoing); Co-supervisor: Dr. Bhanu Pratap, NCPOR Goa
- Tarang Patadiya - Mass balance using satellite photogrammetric techniques (2024-ongoing); Co-supervisor: Dr. Parmanand Sharma, NCPOR Goa

Master's Theses Supervised

- Deepesh Goyal - Monitoring of land subsidence in northern India using time-series InSAR technique (2022)
- Vijaya Kumar Thota - Resolving ice velocity of Himalayan glaciers using SAR remote sensing (2023)
- Adnan Kaisar Khan - Nationwide DEM generation using Sentinel-1 SAR data (2024)

FULL PUBLICATION LIST

1. Kumar, R., and **Vijay, S.** (2026). Automated satellite-based glacial lake inventory and change detection in High Mountain Asia. *Scientific Reports*.
2. Singh, P., **Vijay, S.**, and Azam, M. F. (2026). High-Frequency observation of glacier ice velocities at Drang Drung Glacier, western Himalaya, using a terrestrial time-lapse imaging system. *Science of Remote Sensing, 13*.
3. Sahu, H., Garg, P. K., **Vijay, S.**, and Dasgupta, A. (2026). Predictive drivers and transferability of multi-scale machine learning based crop yield prediction under drought across European and Asian climates. *Agricultural Water Management, 327*, 110254.

4. Singh, P., **Vijay, S.**, Banerjee, A., Sarangi, C., Rashid, I., and Zargar, S. A. (2025). Quantifying short-term backwasting rates of a supraglacial ice cliff at Machoi Glacier in the Indian Himalaya. *Journal of Glaciology*.
5. Verma, S. K., and **Vijay, S.** (2025). Potential of ICESat-2 and multispectral satellite imagery for estimating the depth of shallow glacial lakes in the Himalaya. *Remote Sensing Applications: Society and Environment, 38*, 101577.
6. Das, G., Sharma, P., **Vijay, S.**, et al. (2025). Mapping Glacierized Regions With Quad-Pol Dual Frequency LS-ASAR: Insights for the NISAR Mission. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, 18*, 26338-26354.
7. Laha, S., Majeed, U., Banerjee, A., Rashid, I., Steiner, J., and **Vijay, S.** (2024). Assessing potential risk of glacier avalanches to hydropower infrastructure in the Himalayan region. *Natural Hazards*.
8. Bhat, I. A., Rashid, I., Ramsankaran, R., Banerjee, A., and **Vijay, S.** (2024). Inventorying rock glaciers in the Western Himalaya, India, and assessing their hydrological significance. *Geomorphology*.
9. Banerjee, A., Sarangi, C., Rashid, I., **Vijay, S.**, Najar, N. A., and Chandel, A. S. (2023). A scaling relation for cryoconite holes. *Geophysical Research Letters, 50*(22), e2023GL104942.
10. Khan, S., Bamber, J. L., Rignot, E., Helm, V., Aschwanden, A., Holland, D. M., Broeke, M. V. N., King, M., Noel, B., Truffer, M., Humbert, A., Colgan, W., **Vijay, S.**, and Munneke, P. K. (2022). Greenland mass trends from airborne and satellite altimetry during 2011-2020. *JGR Earth Surface*.
11. Dai, C., Howat, I. M., Freymueller, J. T., Lu, Z., **Vijay, S.**, Liljedahl, A. K., Ward Jones, M. K., Bergstedt, H., and Lev, E. (2022). Quantifying mass flows at Mt. Cleveland, Alaska between 2001 and 2020 using satellite photogrammetry. *Journal of Volcanology and Geothermal Research*.
12. **Vijay, S.**, King, M. D., Howat, I. M., Solgaard, A. M., Khan, S. A., and Noel, B. (2021). Greenland ice-sheet wide glacier classification based on two distinct seasonal ice velocity behaviors. *Journal of Glaciology, 67*(266), 1241-1248.
13. Muller, L., Horwath, M., Scheinert, M., Mayer, C., Ebermann, B., Floricioiu, D., Krieger, L., Rosenau, R., and **Vijay, S.** (2021). Surges of Harald Moltke Brae, north-western Greenland: seasonal modulation and initiation at the terminus. *The Cryosphere*.
14. Farias-Barahona, D., Ayala, A., Bravo, C., Vivero, S., Seehaus, T., **Vijay, S.**, Schaefer, M., Buglio, F., Casassa, G., and Braun, M. H. (2020). 60 years of glacier elevation and mass changes in the Maipo River Basin, Central Andes of Chile. *Remote Sensing, 12*(10), 1658.
15. Dai, C., Howat, I. M., Freymueller, J. T., **Vijay, S.**, and Jia, Y. (2020). Characterization of the 2008 phreatomagmatic eruption of Okmok from ArcticDEM and InSAR: deposition, erosion, and deformation. *Journal of Geophysical Research: Solid Earth*.
16. **Vijay, S.**, Khan, S. A., Kusk, A., Solgaard, A. M., Moon, T., and Bjork, A. A. (2019). Resolving seasonal ice velocity of 45 Greenlandic glaciers with very high temporal details. *Geophysical Research Letters, 46*(3), 1484-1495.
17. Gomez, R., Arigony-Neto, J., Santis, A. D., **Vijay, S.**, Jana, R., and Rivera, A. (2019). Ice dynamics of Union Glacier from SAR offset tracking. *Global and Planetary Change*.
18. Lippl, S., **Vijay, S.**, and Braun, M. (2018). Automatic delineation of debris-covered glaciers using InSAR coherence derived from X-, C- and L-band radar data: a case study of Yazgyl Glacier. *Journal of Glaciology, 64*(247), 811-821.
19. **Vijay, S.**, and Braun, M. (2018). Early 21st century spatially detailed elevation changes of Jammu and Kashmir glaciers (Karakoram-Himalaya). *Global and Planetary Change, 165*, 137-146.
20. **Vijay, S.**, and Braun, M. (2017). Seasonal and interannual variability of Columbia Glacier, Alaska (2011-2016): ice velocity, mass flux, surface elevation and front position. *Remote Sensing*.
21. Khare, S., Ghosh, S. K., Latifi, H., **Vijay, S.**, and Dahms, T. (2017). Seasonal based analysis of vegetation response to environmental variables in the mountainous forests of Western Himalaya using Landsat 8 data. *International Journal of Remote Sensing*.
22. **Vijay, S.**, and Braun, M. (2016). Elevation change rates of glaciers in the Lahaul-Spiti (Western Himalaya, India) during 2000-2012 and 2012-2013. *Remote Sensing*.
23. Holzer, N., **Vijay, S.**, Yao, T., Xu, B., Buchroithner, M., and Bolch, T. (2015). Four decades of glacier variations at Muztag Ata (eastern Pamir): a multi sensor study including Hexagon KH-9 and Pleiades data. *The Cryosphere, 9*(6), 2071-2088.

ACADEMIC LEADERSHIP, SERVICE, AND PROFESSIONAL MEMBERSHIPS

- Initiated informal glaciology meetings in India, leading to IGS India Branch.
- Founded LIGSS for high-altitude training in glaciers, climate, hazards, and remote sensing.
- Membership: International Glaciological Society; European Geosciences Union