Ajay Saraswat (邵亞捷)

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EDUCATION

2021/10 – 2025/06	Ph.D.	Department of Civil Engineering, National Taiwan University (NTU), Taipei, Taiwan
2019/07 – 2021/07	M.Tech.	Department of Civil Engineering, Indian Institute of Technology (I.I.T), Roorkee, India
2014/08 – 2018/08	B.Tech.	Department of Civil Engineering, Dr. APJ Abdul Kalam Technical University, Lucknow, India

EMPLOYMENT

2025/08 - present	Postdoctoral Research Fellow	RCEC, Academia Sinica, Taiwan

HONORS & AWARDS

2024 Excellent Student Paper Award (Second Place), ESRPC, Taiwan
2021 NTU Outstanding International Graduate Student Scholarship, Taiwan
2021 Amba Prasad–Kalawati Memorial Award, IIT Roorkee
2019 MHRD Financial Assistantship for Master's studies, India

RESEARCH INTEREST

As a geospatial researcher, my work centers on time-series Interferometric Synthetic Aperture Radar (InSAR) techniques to monitor urban deformation and ground movements related to geotechnical construction. I have developed a quantitative framework to investigate subsidence influences in complex urban environments, which are primarily driven by groundwater extraction, underground construction, and structural loads. This work leverages long-term satellite datasets to track multi-year deformation trends in evolving cities, while also incorporating spatio-temporal datasets of ongoing and historical city development. Currently, I am engaged in the technical development and enhancement of InSAR methodologies to improve deformation measurement precision. This work centers on modeling and mitigating atmospheric effects, a critical limitation in time-series InSAR

accuracy. These advances enable accurate measurement of both seismic and aseismic deformation, which is vital for long-term geohazard assessment and disaster resilience. Additionally, they support civil engineering applications and contribute to data-driven, resilient urban infrastructure planning.

REPRESENTATIVE PUBLICATIONS (*: corresponding author)

1. **Ajay Saraswat**, Ya-Lun S. Tsai, Fang-Chiung Chen, and Jen-Yu Han. "3D Deformation Analysis in a Metropolitan Area during Ongoing Subway Construction Using Time Series InSAR." *Tunnelling and Underground Space Technology* 155, no. 1 (2025): 106190. https://doi.org/10.1016/j.tust.2024.106190 (SCI)
2. **Ajay Saraswat,** Ya-Lun S. Tsai, and Jen-Yu Han. "Evaluation of Groundwater-Caused Deformation Patterns in a Metropolitan Area Using Time Series InSAR and Retrieval of Vertical and East-West Displacement: A Case Study in Taipei City." *Geomatics, Natural Hazards and Risk* 15 (1) (2024): https://doi.org/10.1080/19475705.2024.2375620 (SCI)
3. Manikandan Sathianarayanan, **Ajay Saraswat**, et al. "Intercomparison between sentinel-1, sentinel-2, and landsat-8 on reservoir water level estimation." *Sustainable Water Resource Management* 9, 185 (2023). https://doi.org/10.1007/s40899-023-00974-4 (ESCI)
4. **Ajay Saraswat**, Ya-Lun S. Tsai, and Jen-Yu Han. "Assessing the impact of city development on vertical ground deformation using satellite-based remote sensing techniques." *[Manuscript under consideration]*. Preprint available at SSRN platform. https://dx.doi.org/10.2139/ssrn.5142812

CONFERENCE ABSTRACTS

1. **Ajay Saraswat**, Jen-Yu Han, and Ya-Lun S. Tsai. "Evaluating Subsidence Within City-Scale Uplift Patterns Amid Ongoing Subway Construction Using PS-InSAR and 3D Velocity Decomposition Techniques." Poster presentation at the *American Geophysical Union (AGU) Fall Meeting*, December 2024, Washington, D.C. (Poster)
2. **Ajay Saraswat**, Ya-Lun S. Tsai, and Jen-Yu Han. "Monitoring Persistent Slow Deformation Patterns in the Taipei Basin Correlating with Groundwater Level Fluctuations Using PS-InSAR Techniques." Paper presented at *The 42nd Conference on Surveying and Geomatics, Taipei, Taiwan*, August 2024 (Oral)
3. Bo-Han Tsao, Jyr-Ching Hu, **Ajay Saraswat**, Chia-Han Zheng, and Yu-Ching Lin. "Surface Deformation due to Weak Layer in Urban Area: A Case Study by Multi-Temporal InSAR on Dazhi, Taipei." Paper presented at *The 9th France-Taiwan Symposium in Earth Sciences*, June 2024 (Poster)

4. Hilmiyati Ulinnuha, Jen-Yu Han, and **Ajay Saraswat**. “Euler Rotation Parameter Estimation in Banda Arc Region.” Research presented at *The South East Asian Surveyor Congress 2022*, August 2022 (Oral)