ADEEL AHMAD, Ph.D.

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PROFILE

Geospatial scientist (Ph.D. Geomatics) specializing in GeoAI and satellite Earth observation for climate and natural-hazard monitoring, including forest structure and carbon, land degradation, wildfire, urban climate, and terrestrial water storage. Former Postdoctoral Fellow at the Taylor Geospatial Institute (TGI), Washington University in St. Louis, building deep learning models and multi-country Earth observation benchmarks. Published in remote sensing journals (IJAEOG, Environmental Monitoring and Assessment) and AI venues (AAAI, CVPR, WACV); reviewer for ISPRS JPRS and GIScience & Remote Sensing. Recipient of Google Earth Engine Partner Tier access (2026). Skilled in PyTorch, Google Earth Engine, Python, and R.

EDUCATION

DOCTORAL DEGREE | PhD in Geomatics | University of the Punjab, Lahore, Pakistan 2014 – 2021
Dissertation: Spatial Resource Assessment of Forests in Azad Jammu and Kashmir, Pakistan using Optical Remote Sensing

MASTER'S DEGREE | MPhil in Geomatics | University of the Punjab, Lahore, Pakistan 2011 – 2013
Dissertation: Quantification of Carbon Stock using Geospatial Technology in the Moist Temperate Himalayan Forest in Pakistan

BACHELOR'S DEGREE | BS in Geography | University of the Punjab, Lahore, Pakistan 2006 – 2010
Areas of concentration: Physical Geography, Digital Cartography, GIS & Remote Sensing

ACADEMIC APPOINTMENTS

ASSISTANT PROFESSOR | Institute of Geography, University of the Punjab | Lahore, Pakistan Jan 2025 – Present

Teaching undergraduate and graduate courses in remote sensing, GIS and GeoAI, and supervising M.Phil. and Ph.D. research.

- Founded and direct the GeoScape Analytics Lab (GSAL), the Institute's research and training lab for remote sensing, GeoAI and spatial modelling.
- Coordinator of the undergraduate (BS) program; Student Advisor; Departmental Controller of Examinations.
- Member, Departmental Doctoral Programme Committee (DDPC) and Board of Studies.
- Contributing to the design of two new degree programs: BS GeoAI and BS Climate Science and Sustainability.
- Member, Committee to Monitor the Admission Process, Institute of Geography (2026).
- Summer School Coordinator, "From Data to Decisions" (June–July 2025): led planning, academic coordination, speaker engagement and delivery of a two-week national training on cloud computing, GeoAI and climate change impact assessment.

POSTDOC FELLOW | Taylor Geospatial Institute (TGI), Washington University | St. Louis, United States Jan 2023 – Jan 2025

Advanced research in geospatial data science, focusing on remote sensing and AI-based environmental monitoring.

- Trained deep learning models on large geospatial datasets on the RIS high-performance computing cluster.
- Led projects on satellite imagery analysis, deep learning for canopy height estimation and large-scale geospatial data integration.
- Contributed to scalable solutions for sustainable land management and to opening geospatial datasets for global scientific use.
- Member of the Taylor Geospatial Engine (TGE) Innovation Bridge 2024 initiative, co-developing the Fields of the World (FTW) benchmark dataset covering over 1.6 million field parcels across 24 countries.
- Co-author of the Best Paper Award-winning paper "Sat2Cap: Mapping Fine-Grained Textual Descriptions from Satellite Images" (CVPR EarthVision Workshop).

LECTURER | Department of Geography, University of the Punjab | Lahore, Pakistan Sep 2018 – Jun 2022

Taught undergraduate and master's courses in Geographic Thought, Fundamentals of Geography, GIS, Remote Sensing, Cartography and Computer Mapping (theory and practical); served as internal and external examiner; and conducted applied research on land use/land cover dynamics, soil erosion modelling, surface water change and urbanization.

- Student Advisor: guided students on course planning and organized curricular and extracurricular events (sports weeks, seminars, guest lectures, field trips).

- Departmental Controller of Examinations: supervised all examination matters, including result notifications for all programs.
- Member, Board of Studies: curriculum preparation, upgrading and approval for the Faculty of Sciences.
- Departmental Focal Person for Career Counseling and Placement.
- Conference Secretary, 16th All Pakistan Geographical Conference (APGC), 11–13 March 2021

LECTURER | Department of Geography, Forman Christian College (A Chartered University) | Lahore, Pakistan
Aug 2014 – Sep 2018

Taught undergraduate geography with a focus on geospatial science and field methods.

- Taught Field Surveying, GIS, Remote Sensing, Geospatial Science and Fundamentals of Geography (theory and practical).
- Designed the syllabi and course structure for the geospatial concentration of the geography program.
- Supervised B.S. dissertations applying GIS and remote sensing to groundwater, landslides and urbanization.
- Advised the Dean Geographical Society (DGS), overseeing events such as Mapathon'17, Geo-Photo Competition and TechNat'18.
- Organized seminars, open houses and field trips (e.g., PDMA Punjab) linking students with practitioners.

RESEARCH ASSOCIATE | Institute of Geology, University of the Punjab | Lahore, Pakistan Aug 2012 – Jul 2013

Conducted practical GIS labs for master's Geomatics and undergraduate Geology classes, supported research articles and managed geospatial data in the Geomatics lab.

LECTURER | Department of Geography, University of the Punjab | Lahore, Pakistan Feb 2011 – Mar 2012

Taught GIS/RS techniques, Fundamentals of GIS, Principles of Remote Sensing, Surveying, Map Reading & Interpretation and GPS; organized national events on disaster management.

VISITING APPOINTMENTS

VISITING ASSISTANT PROFESSOR | College of Earth and Environmental Sciences (CEES), University of the Punjab | Lahore, Pakistan Sep 2025 – Jan 2026

Taught the graduate course Remote Sensing of Landscape Dynamics (theory and practical) to M.Phil. Geomatics students: LULC change, vegetation dynamics, NDVI time series, trend detection, soil erosion, canopy height estimation, and Google Earth Engine workflows.

VISITING LECTURER | College of Earth and Environmental Sciences (CEES), University of the Punjab | Lahore, Pakistan
Sep 2015 – Jun 2016

Taught "GIS & RS" (undergraduate Environmental Sciences) and "Environmental Modeling & Spatial Simulation" (M.Phil. Geomatics): multicriteria site suitability, AHP, service area analysis, watershed modelling, and mobile GIS data collection.

RESEARCH GRANTS, COMPUTING AWARDS AND HONORS

Google Earth Engine Partner Tier access (up to 100,000 EECU-hours compute/ month), Google — awarded for national-scale Earth observation research at GSAL Aug 2026 – Feb 2027
Best Paper Award (co-author), CVPR EarthVision Workshop, for "Sat2Cap" 2024
1st Position Holder Certificate, M.Phil. in Geomatics (CGPA 3.87/4.00) 2014
University Gold Medalist, B.S. in Geography (CGPA 3.88/4.00) 2012
Merit Scholarships, M.Phil. in Geomatics 2011 – 2013
Merit Scholarships, B.S. in Geography 2007 – 2010

EDITORIAL AND PEER REVIEW SERVICE

EDITORIAL (IN DEVELOPMENT)

- Lead organizer and proposed Lead Guest Editor, Research Topic "GeoAI for Earth, Environment, and Climate", Frontiers in Artificial Intelligence (proposal in preparation, with co-editors from Pakistan and the United States), 2026

JOURNAL REVIEWER

- ISPRS Journal of Photogrammetry and Remote Sensing; IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing; International Journal of Digital Earth; GIScience & Remote Sensing; Geoderma; Forest Ecology and Management; Journal of Biogeography; Forestry: An International Journal of Forest Research; Natural Hazards; European Journal of Remote Sensing; Ecology and Evolution; Earth Systems and Environment; Physics and Chemistry of the Earth;

Environmental Science and Pollution Research; Arabian Journal of Geosciences; PLOS ONE; Environmental and Sustainability Indicators; Plant-Environment Interactions; Journal of Sustainable Forestry; Kuwait Journal of Science; Journal of Himalayan Earth Sciences

CONFERENCE REVIEWER

- International Conference on Frontiers of Information Technology (FIT 2026)

THESIS EXAMINATION AND EXTERNAL ACADEMIC BODIES

- External Examiner, MS Remote Sensing & GIS thesis defense, Institute of Space Technology (IST), Islamabad, September 2025
- Member, Board of Studies, Department of Geography, Government College Women University Faisalabad (GCWUF), 2026 – present

RESEARCH SUPERVISION/ MENTORSHIP

PH.D.

- Ayesha Riaz, University of the Punjab: "Geographical Assessment of Landscape Fragmentation and Biodiversity in the Hindu-Kush-Himalaya Region", 2026 – present (Supervisor, in progress)
- Sadaf Safdar, University of the Punjab: "Assessment of Forest Biodiversity under Climate Change Scenario in Khyber Pakhtunkhwa, Pakistan", 2022 – 2026 (Supervisor; thesis submitted, under external evaluation)

M.S./ M.PHIL.

- Iqra Komal, Institute of Geography, University of the Punjab (M.Phil., in progress) (Supervisor)
- Syeda Sadia Bano Bukhari, Institute of Geography, University of the Punjab: "Trends in Urban Dry/Wet Island Effect over Three Decades (1994–2024) in Lahore, Pakistan", 2024 – 2026 (Supervisor)
- Shahzaib Nasir, M.Phil. Geomatics, CEES, University of the Punjab: "Automated Extraction of Urban Building Footprints from VHR Imagery Using Deep Learning", 2025 – 2026 (Co-Supervisor)
- Haris Naveed, Washington University in St. Louis, USA: "Fusing GEDI and Sentinel-2 Imagery to Estimate Tree Canopy Heights", 2023 – 2024 (Co-Supervisor)
- Farhan Khan, University of the Punjab: "Spatiotemporal Fragmentation and Pattern Analysis of Forest Cover in Hindu-Kush-Himalayan Region, Pakistan", 2022 – 2023 (Co-Supervisor)
- Aneeq ur Rehman, University of the Punjab: "Selection of Disposal Waste Site using Multi-Criteria Decision Making Analysis and GIS in Dera Ghazi Khan District, Pakistan", 2019 – 2020 (Co-Supervisor)

B.S.

- Muhammad Mehdi, Institute of Geography, University of the Punjab (in progress) (Supervisor)
- Muhammad Hussain, Institute of Geography, University of the Punjab (in progress) (Supervisor)
- Atiqa Khan, Institute of Geography, University of the Punjab (in progress) (Supervisor)
- Baseer Ahmed, Forman Christian College: "Assessing Groundwater Depletion in Quetta Valley using GIS Analysis and Its Impacts on Local Residents", 2017 – 2018 (Supervisor)
- Nouman Afzal, Forman Christian College: "GIS-based Landslide Susceptibility Mapping using AHP: A Case Study of Astore Region, Northern Pakistan", 2017 – 2018 (Supervisor)
- Shah Rukh Khan, Forman Christian College: "Impact Assessment of CPEC on Urbanization using Geospatial Data and Techniques (Gwadar District)", 2016 – 2017 (Supervisor)

PUBLICATIONS

- Khanal, S., Sastry, S., Dhakal, A., **Ahmad, A.**, Stylianou, A., & Jacobs, N. (**2026**). Sat2Sound: A Unified Framework for Zero-Shot Soundscape Mapping. In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition – Workshop (CVPR-W). [Link]
- **Ahmad, A.**, Sastry, S., Dhakal, A., Khanal, S., Levering, A., Gilani, H., & Jacobs, N. (**2026**). Canopy height mapping in the Western Himalayas, Pakistan: A deep learning approach using GEDI and Sentinel-2 fusion. International Journal of Applied Earth Observation and Geoinformation, 146, 105030. [Link]
- Safdar, S., and **Ahmad, A.** (**2025**). Modeling Forest Biodiversity under Climate Change: A MaxEnt Case Study of Cedrus Deodara in Khyber Pakhtunkhwa, Pakistan. Journal of Himalayan Earth Sciences, 58(2), 116-128. [Link]
- Arshad, N., Mazhar, N., & **Ahmad, A.** (**2025**). Assessment of Air Quality Variations in Punjab, Pakistan Using Sentinel-5P during COVID-19 Lockdowns. Environmental Monitoring and Assessment, 197(12), 1328. [Link]
- Dhakal, A., Sastry, S., Khanal, S., **Ahmad, A.**, Xing, E., & Jacobs, N. (**2025**). RANGE: Retrieval Augmented Neural Fields for Multi-Resolution Geo-Embeddings. In Proceedings of the Computer Vision and Pattern Recognition Conference (pp. 24680-24689). [Link]

- Kerner, H., Chaudhari, S., Ghosh, A., Robinson, C., **Ahmad, A.**, Choi, E., Jacobs, N., Holmes, C., Mohr, M., Dodhia, R., Ferres, J. M. L., & Marcus, J. (**2025**, April). Fields of The World: A machine learning benchmark dataset for global agricultural field boundary segmentation. In Proceedings of the AAAI Conference on Artificial Intelligence (Vol. 39, No. 27, pp. 28151-28159). [Link]
- Favarão Leão, A. L., Banda, B., Xing, E., Gudapati, S., **Ahmad, A.**, Lin, J., Sastry, S., Jacobs, N., & Siqueira Reis, R. (**2025**). Applications of artificial intelligence in public health: analyzing the built environment and addressing spatial inequities. Journal of Public Health, 1-11. [Link]
- Sastry, S., Khanal, S., Dhakal, A., **Ahmad, A.**, & Jacobs, N. (**2025**, February). Taxabind: A unified embedding space for ecological applications. In 2025 IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) (pp. 1765-1774). IEEE. [Link]
- **Ahmad, A.**, Ahmad, S. R., Gilani, H., & Nowosad, J. (**2025**). Assessment of forest fragmentation and ecological dynamics in Western Himalayan Region over three decades (1990–2020). Environmental Monitoring and Assessment, 197(2), 205. [Link]
- Safdar, S., Younes, I., **Ahmad, A.**, & Sastry, S. (**2025**). A comprehensive review of spatial distribution modeling of plant species in mountainous environments: Implications for biodiversity conservation and climate change assessment. Kuwait Journal of Science, 52(1), 100337. [Link]
- Khanal, S., Xing, E., Sastry, S., Dhakal, A., Xiong, Z., **Ahmad, A.**, & Jacobs, N. (**2024**, October). PSM: learning probabilistic embeddings for multi-scale zero-shot soundscape mapping. In Proceedings of the 32nd ACM International Conference on Multimedia (pp. 1361-1369). [Link]
- **Ahmad, A.**, Dhakal, A., Sastry, S., Khanal, S., Xing, E., & Jacobs, N. (**2024**, December). Improved Canopy Vertical Structural Diversity Mapping Across Varied Topographies Using Deep Learning Techniques. In AGU Fall Meeting Abstracts (Vol. 2024, pp. B52B-07). [Link]
- Sastry, S., **Ahmad, A.**, Dhakal, A., Khanal, S., Xing, E., & Jacobs, N. (**2024**, December). ClimSatDiff: Synthesizing the Earth's Surface Conditioned on Climatic Variables using Diffusion Models. In AGU Fall Meeting Abstracts (Vol. 2024, pp. GC01-61). [Link]
- Kerner, H., Chaudhari, S., Ghosh, A., Robinson, C., **Ahmad, A.**, Choi, E., Jacobs, N., Holmes, C., Mohr, M., Dodhia, R., Ferres, J. M. L., & Marcus, J. (**2024**, December). Fields of The World (FTW!): A New Machine Learning Dataset for Agricultural Field Boundary Segmentation on Four Continents. In AGU Fall Meeting Abstracts (Vol. 2024, pp. B52C-03). [Link]
- Fatima, M., **Ahmad, A.**, Butt, I., Arshad, S., & Kiani, B. (2024). Geospatial modelling of ambient air pollutants and chronic obstructive pulmonary diseases at regional scale in Pakistan. Environmental Monitoring and Assessment, 196(10), 929. [Link]
- Rehman, A. U., **Ahmad, A.**, Sadef, Y., & Ahmad, S. R. (**2024**). Spatial Evaluation of Waste Disposal Site Selection Using GIS-Based Multi-Criteria Analysis: A Case Study of Dera Ghazi Khan District, Pakistan. Indonesian Journal of Geography, 56(2), 242-253. [Link]
- Dhakal, A., Khanal, S., Sastry, S., **Ahmad, A.**, & Jacobs, N. (**2024**). GEOBIND: Binding Text, Image, and Audio through Satellite Images. International Geoscience and Remote Sensing Symposium (IGARSS). [Link]
- Raza, D., Khushi, M., Shu, H., Aslam, H., Saleem, M. S., **Ahmad, A.**, Mirza, S., & Khan, S. U. (**2024**). CA-ANN based LULC prediction and influence assessment on LST-NDVI using multi-temporal satellite images. Environmental Earth Sciences, 83(5), 144. [Link]
- Dhakal, A., **Ahmad, A.**, Khanal, S., Sastry, S., Kerner, H., & Jacobs, N. (**2024**). Sat2cap: Mapping fine-grained textual descriptions from satellite images. In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition – Workshop (CVPR-W) (pp. 533-542). [Link]
- Khushi, M., Raza, D., Kamran, M., Nazeer, M., **Ahmad, A.**, Khan, S. U., & Younas, I. (**2023**). Delineation of groundwater potential zones with Analytic Hierarchy Process based geospatial modelling approach in metropolitan expanse. Desalination and Water Treatment, 315, 399-412. [Link]
- Sastry, S., Xing, E., Dhakal, A., Khanal, S., **Ahmad, A.**, & Jacobs, N. (**2023**). LD-SDM: Language-Driven Hierarchical Species Distribution Modeling. [Link]
- Mazhar, N., Javid, K., Akram, M. A. N., Afzal, A., Hamayon, K., & **Ahmad, A.** (**2023**). Index-Based Spatiotemporal Assessment of Water Quality in Tarbela Reservoir, Pakistan (1990– 2020). Geography, Environment, Sustainability, 15(4), 232-242. [Link]
- **Ahmad, A.**, Ahmad, S. R., & Gilani, H. (**2023**). Potential Tree Species Distribution Modelling Using MaxEnt Model for Resource Partitioning in Azad Jammu and Kashmir (AJK), Pakistan. In Concepts and Applications of Remote Sensing in Forestry (pp. 135-152). Singapore: Springer Nature Singapore. [Link]
- Afzal, N., **Ahmad, A.**, Shirazi, S. A., Younes, I., & Ha, L. T. T. (**2022**). GIS-based landslide susceptibility mapping using analytical hierarchy process: a case study of Astore region, Pakistan. EQA-International Journal of Environmental Quality, 48, 27-40. [Link]
- Khushi, M., Ahmad, S. R., **Ahmad, A.**, Butt, I., Akram, W., & Akhtar, A. (**2022**). Role of Geospatial Technology in Crime Mapping & Analysis: A Case Study of District Kasur, Punjab, Pakistan. International Journal of Innovations in Science & Technology, 4(3), 751–762. [Link]

- Ahmed, N., Wang, G., Booij, M. J., Ceribasi, G., Bhat, M. S., Ceyhunlu, A. I., & **Ahmad, A.** (**2022**). Changes in monthly streamflow in the Hindukush–Karakoram–Himalaya Region of Pakistan using innovative polygon trend analysis. Stochastic Environmental Research and Risk Assessment, 36(3), 811-830. [Link]
- **Ahmad, A.**, Gilani, H., Shirazi, S. A., Pourghsemi, H. R., & Shaukat, I. (**2022**, April). Lahore, the city of gardens, has lost 70% of its tree cover (اپ لاہور شہر کا باغوں 70 ن. درختوں فیصد سے محروم ہو چکا ہے). Express Sunday Magazine. [Link]
- **Ahmad, A.**, Gilani, H., Shirazi, S. A., Pourghsemi, H. R., & Shaukat, I. (**2022**). Spatiotemporal urban sprawl and land resource assessment using Google Earth Engine platform in Lahore district, Pakistan. In Computers in Earth and Environmental Sciences (pp. 137-150). Elsevier. [Link]
- Gilani, H., **Ahmad, A.**, Younes, I., & Abbas, S. (**2022**). Impact assessment of land cover and land use changes on soil erosion changes (2005–2015) in Pakistan. Land Degradation & Development, 33(1), 204-217. [Link]
- Tufail, R., **Ahmad, A.**, Javed, M. A., & Ahmad, S. R. (**2022**). A machine learning approach for accurate crop type mapping using combined SAR and optical time series data. Advances in Space Research, 69(1), 331-346. [Link]
- **Ahmad, A.**, Ahmad, S. R., Gilani, H., Tariq, A., Zhao, N., Aslam, R. W., & Mumtaz, F. (2021). A synthesis of spatial forest assessment studies using remote sensing data and techniques in Pakistan. Forests, 12(9), 1211. [Link]
- **Ahmad, A.**, Gilani, H., & Ahmad, S. R. (**2021**). Forest aboveground biomass estimation and mapping through high-resolution optical satellite imagery—A literature review. Forests, 12(7), 914. [Link]
- Hassan, I., Javed, M. A., Asif, M., Luqman, M., Ahmad, S. R., **Ahmad, A.**, Akhtar, S., & Hussain, B. (**2020**). Weighted overlay based land suitability analysis of agriculture land in Azad Jammu and Kashmir using GIS and AHP. Pakistan Journal of Agricultural Sciences, 57(6). [Link]
- Tong, S. S., Pham, T. L., Nguyen, Q. L., Le, T. T. H., Cao, X. C., **Ahmad, A.**, & Tong, T. H. A. (**2020**). The study of land cover change using change vector approach integrated with unsupervised classification method: A case in duy tien (Vietnam). Geography, Environment, Sustainability, 13(2), 175-184. [Link]
- Nguyen, B. D., Minh, D. T., **Ahmad, A.**, & Nguyen, Q. L. (**2020**). The role of relative slope length in flood hazard mapping using AHP and GIS (case study: Lam River Basin, Vietnam). Geography, Environment, Sustainability, 13(2), 115-123. [Link]
- Ashraf, N., Ahmad, S. R., **Ahmad, A.**, & Javed, M. A. (**2020**). Assessment of Land Suitability for Tea Cultivation Using Geo-Informatics in the Mansehra and Abbottabad District. Pakistan Journal of Scientific & Industrial Research Series A: Physical Sciences, 63(1), 65-70. [Link]
- Shirazi, S. A., **Ahmad, A.**, & Qureshi, S. (**2020**). Assessing the Impact of Land Use and Land Cover (LULC) Changes on the Biodiversity of River Ravi, Lahore—Pakistan. In Making Green Cities: Concepts, Challenges and Practice (pp. 245-261). Cham: Springer International Publishing. [Link]
- Bui, X. N., Lee, C., Nguyen, Q. L., **Ahmad, A.**, Cao, X. C., Nguyen, V. N., Le, V. C., Nguyen, H., Le, Q. T., Duong, T. H., & Nguyen, V. D. (**2019**). Use of unmanned aerial vehicles for 3D topographic mapping and monitoring the air quality of open-pit mines. Inżynieria Mineralna, 21(2/2), 223-239. [Link]
- Jahan, Z., Sarwar, F., Younes, I., Sadaf, R., & **Ahmad, A.** (**2019**). Assessment of smog pattern and its effects on visibility in Lahore using remote sensing and GIS. International Journal of Economic and Environmental Geology, 10(2), 55-59. [Link]
- Long, N. Q., **Ahmad, A.**, & Cuong, C. X. (**2019**). Designing observation lines: a case study of the G9 seam in the Mong Duong colliery. Journal of Mining and Earth Sciences, 60(3), 0-0. [Link]
- Gilani, H., & **Ahmad, A.** (**2018**, October). Lahore is losing its green cover—fast. MIT Technology Review. [Link]
- **Ahmad, A.** (2017). Estimating Forest Tree Carbon using Remote Sensing Data and Techniques (M.Phil. thesis, University of the Punjab). Noor Publishing. ISBN 978-620-2-34061-8. [Link]
- Akram, W., **Ahmad, A.**, Javed, M. A., & Raoof, A. (**2017**). Exploring existing spatial patterns of diarrhea and proposing new health unit using GIS in district Vehari, Punjab Pakistan. In Geo-Spatial Technologies and Earth Resources 2017 (GTER 2017) (pp. 83-90). Hanoi: Publishing House for Science and Technology. [Link]
- **Ahmad, A.**, Ahmad, S. R., Javaid, U. & Javed, M. A. (**2017**). Above Ground Carbon Quantification in a Moist Temperate Himalayan Forest. In First International Conference on Emerging Trends in Earth and Environmental Sciences (ETEES). Lahore, Pakistan. [Link]
- Ali, M., Ahmad, S. R., Javed, M. A., **Ahmad, A.**, & Waqas, M. (**2017**). A GIS Based Water Loss Assessment and Real Time Leakage Detection in Water Supply Pipelines of Faisalabad City. In First International Conference on Emerging Trends in Earth and Environmental Sciences. Lahore. [Link]
- **Ahmad, A.**, Javaid, U., Javed, M. A., Ahmad, S. R., Jaffri, M. A., & Ashfaq, M. (**2016**). Landfill sites identification using GIS and multi-criteria method: a case study of intermediate city of Punjab, Pakistan. Journal of Geographic Information System, 8(1), 40-49. [Link]
- Javaid, U., Ahmad, S. R., **Ahmad, A.**, & Javed, M. A. (**2015**). Assessment of Transit Stops Service Area Using Geographical Information System–A Case Study of Punjab University Transportation. Pakistan Journal of Science, 67(4). [Link]
- Ahmad, S. R., Javaid, U., **Ahmad, A.**, & Taj AA. (**2013**). Assessment of Transit Stop Service Area using GIS: A Case Study of Punjab University Transportation. In IEEE: International Conference on Aerospace Science and Engineering (ICASE). Islamabad, Pakistan.

- Ahmad, S. R., **Ahmad, A.**, Javaid, U., & Javed, M. A. (**2013**). Multi-Criteria based Landfill Sites Identification by using GIS: A Case Study of Sahiwal Tehsil, Pakistan. In IEEE: International Conference on Aerospace Science and Engineering (ICASE). Islamabad, Pakistan.
- Sanaullah, M. & **Ahmad, A.** (**2013**). Morphometric Relation to the Geological Structures of Haro River Drainage Basin, Northern Pakistan. In 10th Meeting of the Saudi Society for Geosciences: Geosciences for Sustainable Development. Dhahran, Saudi Arabia. [Link]
- Javed, M. A., Ahmad, S. R., **Ahmad, A.**, Taj, A. A., & Khan, A. (**2013**). Assessment of neighborhood parks using GIS techniques in Sheikhupura city. Pakistan journal of science, 65(2). [Link]
- **Ahmad, A.**, Ali, S., & Mushtaq, A. (**2012**). Analyzing health facility localities in relation with population distribution using GIS techniques for Lahore city. In 5th National Undergraduate Medical Research Fair. Peshawar, Pakistan.

INVITED TALKS, PRESENTATIONS AND WORKSHOPS

- AI And Machine Learning for Climate Change and Disasters (Session Co-Chair), *19th All Pakistan Geographical Conference (APGC)*, Government College University (GCU), Lahore, Pakistan, 13–15 October 2026
- *Satellite to Solutions* (Invited Speaker), IEEE GRSS Lahore Chapter, Remote Sensing and Spatial Analytics (RSA) Lab, Information Technology University (ITU), Lahore, Pakistan, April 2026 [Link]
- *Data Analytics and Visualization* (Trainer), Orientation and Capacity Building Workshop by Population Council for the Officers of Health & Population Department, Govt. of the Punjab, Islamabad, Pakistan, March 2026
- *Data Analytics and Visualization* (Trainer), Orientation and Capacity Building Workshop by Population Council for the Officers of Health & Population Department, Govt. of the Punjab, Lahore, Pakistan, February 2026
- *GeoAI for a Changing Planet* (Guest Lecture), School of Interdisciplinary Engineering & Sciences (SINES), National University of Sciences and Technology (NUST), Islamabad, Pakistan, December 2025 [Link]
- *GeoAI for Risk Mapping* (Ignite Talk), Disaster Early Warning Tech Expo (DEWTE), National Disaster Management Authority (NDMA), Islamabad, Pakistan, December 2025 [Link]
- *GeoAI for a Sustainable Future: Harnessing Artificial Intelligence in Geography* (Invited Talk), Department of Geography/ Dean Geographical Society (DGS), Forman Christian College (A Chartered University), Lahore, Pakistan, September 2025 [Link]
- *Tree Canopy Height Mapping in GEE* (Invited Talk), Summer School 2025 at the Institute of Geography, University of the Punjab, Lahore, Pakistan, Jul 2025 [Link]
- *GeoAI* (Invited Talk), Department of Geography/ Dean Geographical Society (DGS), Forman Christian College (A Chartered University), Lahore, Pakistan, May 2025 [Link]
- *A Deep Learning Approach for Predicting Canopy Height using GEDI and Sentinel-2 in the Western Himalayan Mountainscape* (Poster Presentation), 1st Town Hall Event, Taylor Geospatial Institute, St. Louis (Missouri), USA, May 2024 [Link]
- *Canopy Vertical Structural Diversity Mapping in Varied Topographies incorporating Multi-Source and Topography Datasets in Deep Learning Techniques* (Oral Presentation), American Geophysical Union (AGU), Washington DC, USA, December 2024 [Link]
- *Harnessing the Power of Deep Learning for Geospatial Discovery* (Online Talk), "Geospatial Technologies: A Key to Transform our World through Spatial Analysis for Better Understanding" by Department of Geography/ Dean Geographical Society (DGS), Forman Christian College (A Chartered University), Online, December 2023 [Link]
- *Multi-Source Remote Sensing for Tree Height Modeling* (Lightning Talk), "TGI Research Day" by Taylor Geospatial Institute, St. Louis, USA, April 2023 [Link]
- *National/ International Training on Environmental and Climate Change Analysis using Google Earth Engine [Online]* (Moderator), Geo-Spatial Works, Lahore, Pakistan, Jan 2021 & Dec 2020 [Link]
- *1st Anniversary of Course on Big Geospatial Data Analysis using Google Earth Engine* (Moderator), Geo-Spatial Works, Lahore, Pakistan, Jul 2019 [Link]
- *Applications of Remote Sensing in Geography* (Workshop Instructor), Department of Geography, Kinnaird College for Women University, Lahore, Pakistan, Nov 2018
- *Big Geospatial Data Analysis using Google Earth Engine* (Moderator), Geo-Spatial Works, Lahore, Pakistan, Jul 2018 [Link]
- *Capacity Building Workshop on GPS, GIS, and Watershed Modeling Techniques* (Training Instructor), Water Management Training Institute (WMTI), Government of Punjab, Lahore, Pakistan, May 2017 & Jan 2018
- *Pre-Conference GIS Training Workshop, Emerging Trends in Earth and Environmental Sciences (ETEES) Conference* (Training Instructor), College of Earth and Environmental Sciences (CEES), University of the Punjab, Lahore, Pakistan, Mar 2017 [Link]
- *Training Workshop on Humanitarian Mapping for Disaster Response* (Mapping Co-Trainer), Kinnaird College for Women University (KCWU) and Forman Christian College University (FCCU), Lahore, Pakistan, Nov 2015
- *Multiple One-Month GIS Short Training Courses* (Instructor), University of the Punjab, Lahore, Pakistan, Feb 2011 – Aug 2016

CAPACITY BUILDING AND TRAINING EXPERIENCE

Date	Role / Training	Institution	Brief Description
Feb & Mar 2026	GIS Trainer, Data Analytics and Visualization	Population Council / Health & Population Department, Lahore and Islamabad	Delivered provincial-level GIS training for representatives from districts across Punjab.
Jun – Oct 2025	Lead Organizer / Trainer, GEE and Remote Sensing Trainings	University of the Punjab and Kinnaird College, Lahore	Led and co-delivered national training on Google Earth Engine, cloud computing, geospatial big data, and AI for climate and environmental applications.
Dec 2020 – Jan 2021	Lead Organizer, Moderator and Co-Trainer, International and National Online Trainings on Environmental and Climate Change Analysis using GEE	Geo-Spatial Works (Online)	Organized and moderated national and international online programs on remote sensing fundamentals, Earth observation data access, time series analysis and introductory Earth Engine app development.
Jul 2018	Lead Organizer and Manager, Big Geospatial Data Analysis using GEE	Geo-Spatial Works, Lahore	Hands-on professional training on large-scale geospatial data processing, Earth Engine programming and applied environmental analysis.
Mar 2017 – Jul 2018	Co-Trainer, GIS / RS / GEE Workshops	University of the Punjab and Geo-Spatial Works	Hands-on training in GIS, remote sensing, image classification, time series analysis and Earth Engine workflows.
Oct 2011 – Sep 2016	Course Instructor, Short GIS and ArcGIS Courses	University of the Punjab	Multiple one-month courses covering georeferencing, digitization, spatial analysis, cartography and applied mapping.

INDUSTRY APPOINTMENTS

GIS ANALYST | MM Pakistan Private Limited | Lahore, Pakistan Aug 2013 – Aug 2014

Irrigation network development, LULC mapping, resettlement, drainage, EIA, watershed and road/railway mapping (ArcGIS, ERDAS Imagine) for national and international projects, including:

- Monitoring & Evaluation of Punjab Agriculture Productivity Improvement Project (PIPIP) | Donor Agency: **World Bank** [Info]
- Planning and Preparation of Detailed Design and PC-1 of 7 Medium Dams in Kirthar Mountains in Kohistan Region Sindh | Donor Agency: **World Bank and Irrigation and Power Department**, Government of Sindh, Pakistan
- Feasibility Study for Rehabilitation & Modernization of Guddu Barrage – Assignment A | Donor Agency: **World Bank** [Info]
- Planning, Design, and Project Management Consultancy Services for Zarkon Hills Project | Donor Agency: **Zarkon International (Pvt) Ltd.**
- Consultancy Services for Feasibility Studies, PC-1, Tender Documents, Procurement of Plant and Construction Supervision of 50 MW Imported Thermal Power Projects on EPC Basis at Industrial Estates (i) Sunder Lahore (ii) M-3 Industrial City Faisalabad | Donor Agency: **Punjab Power Development Company Limited (PPDCL)**, Pakistan [Info]
- Construction Supervision of Kurram Tangi Dam | Donor Agency: **World Bank and WAPDA**, Pakistan [Info]
- Preparing Irrigation Master Plan for SATPARA Dam Command Area Projects | Donor Agency: **Asian Development Bank (ADB) and Agha Khan Foundation**, Pakistan [Info]
- Punjab Barrages Improvement Project Phase 2 (PBIP - II) | Donor Agency: **World Bank** [Info]
- Sediment Management Study of Tarbela Reservoir | Donor Agency: **World Bank and WAPDA**, Pakistan [Info]
- Solid Waste Management Studies of Towns of Central Cluster of Province of Sindh under Sindh Cities Improvement Program Phase - 04 (SCIP-IV) | Donor Agency: **Asian Development Bank (ADB) and Brisbane City Enterprises Pvt. Ltd**. [Info]
- District-wise Socio-Economic ATLAS Development of Balochistan Province, Pakistan | Donor Agency: **UNICEF**

GIS ASSOCIATE | Eycon Private Limited | Islamabad, Pakistan Nov 2010 – Feb 2011

Produced over 1,600 small- and large-scale cartographic maps, from data collection and georeferencing to spatial analysis and final map production.

GIS RESOURCE PERSON | Grass-Root Human Deployment Organization (GODH) | Lahore, Pakistan Sep 2010 – Nov 2010

Developed a wall-sized, Urdu-labelled botanical herbal distribution map of a Punjab district through primary data collection.

GIS INTERN | Directorate General of Mines & Minerals, Government of Punjab (GoP) | Lahore, Pakistan Feb 2010 – Mar 2010

Georeferenced and digitized geological sheets for the Jhelum and Rawalpindi regions (ArcGIS 9.3, ERDAS Imagine 9.1).

CERTIFICATIONS

- The PyTorch Basics You Need to Start Your ML Projects — Coursera Project Network — Jun 2023
- Exploratory Data Analysis for Machine Learning — IBM (Coursera) — May 2023
- Aerial Image Segmentation with PyTorch — Coursera Project Network — Apr 2023
- Programming for Everybody (Getting Started with Python) — University of Michigan (Coursera) — Feb 2023
- AI for Everyone — DeepLearning.AI (Coursera) — Feb 2023
- Cartography — Esri MOOC — Jun 2018
- Introduction to GPM Data and Applications — NASA Applied Remote Sensing Training (ARSET) — Mar 2015

OPEN RESEARCH OUTPUTS (DATASETS, SOFTWARE AND APPS)

Datasets

- WHiCH (Western Himalaya Canopy Height) Map 2020, Pakistan. Zenodo, 2025. — Zenodo | GEE Community Catalog
- National-Scale Soil Erosion Dataset of Pakistan (2005 and 2015) at 1 km Spatial Resolution. Zenodo, 2024. — Zenodo | GEE Community Catalog

Software and Platforms (GeoScape Analytics Lab)

- GRIPS: Geospatial Research Index of Pakistan Studies, v1.0.0, 2026. — Zenodo | Launch
- GeoDROP: Geospatial Datasets Repository of Pakistan, 2026. — Launch

Google Earth Engine Apps

- Mangrove cover change in Pakistan (1990–2020): evaluating mangrove conservation and sustainability. — App Link
- Impact of land cover and land use change on soil erosion in Pakistan (2005–2015). — App Link
- Cedrus deodara habitat under future climate scenarios in Khyber Pakhtunkhwa, Pakistan. — App Link
- Western Himalaya Canopy Height (WHiCH) Map 2020, Pakistan. — App Link

REFERENCES

Available upon request.