Shahid Nawaz Khan, PhD

Assistant Professor of Geoinformatics, Institute of Geographical Information Systems (IGIS), National University of Sciences and Technology (NUST), H-12, Islamabad, Pakistan
snawaz@igis.nust.edu.pk · shahidnawazkhan.github.io · ORCID 0000-0003-2185-7276 · Google Scholar: scholar.google.com/citations?user=xC5×7P0AAAAJ

EDUCATION

Aug 2023 – Aug 2025
PhD in Geography (Remote Sensing Specialization)
Department of Geography and the Environment, *The University of Alabama*, Tuscaloosa, AL, USA
Dissertation: Using Remote Sensing and Machine Learning to Improve County-level Crop Yield Predictions in the US Corn Belt
Advisor: Dr. Dapeng Li

Jan 2021 – May 2023
MS in Geographical Information Systems
Department of Geography and Geospatial Sciences, *South Dakota State University*, Brookings, SD, USA
Advisor: Dr. Dapeng Li

Sep 2016 – Aug 2018
MS in Remote Sensing and GIS (Concentration: GIS, Remote Sensing, & Web GIS)
Institute of Geographical Information Systems, School of Civil and Environmental Engineering, *National University of Sciences & Technology*, Pakistan
Dissertation: Optimizing Allocations Decision in Open and Distance Learning using Agent-based Model and Spatial Decision Support Systems
Advisor: Dr. Ali Tahir

Sep 2012 – Jun 2016
Bachelors in Geoinformatics Engineering (Concentration: GIS, Remote Sensing, Digital Image Processing, & Web GIS)
Institute of Geographical Information Systems, School of Civil and Environmental Engineering, *National University of Sciences & Technology*, Pakistan

EMPLOYMENT

Aug 2025 – Present
Assistant Professor of Geoinformatics
Institute of Geographical Information Systems (IGIS), School of Civil and Environmental Engineering (SCEE), NUST, Islamabad, Pakistan

May 2025 – Aug 2025
Graduate Research Assistant
Environmental Remote Sensing Lab, The University of Alabama, Tuscaloosa, AL

Jan 2025 – May 2025
Instructor of Record
Department of Geography and the Environment, The University of Alabama, Tuscaloosa, AL

Aug 2023 – Dec 2024
Graduate Teaching Assistant
Department of Geography and the Environment, The University of Alabama, Tuscaloosa, AL

May 2023 – Aug 2023
GIS Developer
Department of Geography and Geospatial Sciences, South Dakota State University, Brookings, SD

Jan 2021 – May 2023
Graduate Research Assistant
Department of Geography and Geospatial Sciences, South Dakota State University, Brookings, SD

Oct 2018 – Dec 2020
Lecturer of Geoinformatics
Institute of Geographical Information Systems, National University of Sciences and Technology (NUST), Pakistan

Jan 2018 – Oct 2018 **Graduate Teaching Assistant**
Institute of Geographical Information Systems, National University of Sciences and Technology (NUST), Pakistan
Supervisor: Dr. Javed Iqbal

Dec 2016 – Oct 2018 **GIS Developer**
GIS Plus, Technology Incubation Center, National University of Sciences and Technology (NUST), Pakistan

RESEARCH

Research and teaching interests

Methods: Machine Learning, Remote Sensing, GIS Development, Spatial Databases, Spatial Data Analysis

Foci: Agriculture, Natural Resources, Environment, Sustainability

Refereed Journal Articles

2026 Haq, S. I. U., **Khan, S. N.**, Ibrahim, M., Wang, G., Song, C., Tahir, M. N., & Lan, Y. (2026). AI-enabled phenomics of combined abiotic stress: Linking field signatures to plant multi-omics. *Plant Physiology and Biochemistry*, 111820. doi:10.1016/j.plaphy.2026.111820

2026 Khan, K., **Khan, S. N.**, & Khokhar, M. F. (2026). Using Remote Sensing Data and Google Earth Engine to Quantify Regional Climate Responses to Afforestation. *Remote Sensing*, 18(14), 2305.

2026 Billah, M. M., Maimaitijiang, M., Kaushal, S., Millett, B., **Khan, S. N.**, Halder, J., ... & Sehgal, S. K. (2026). Predicting wheat yield and grain quality with UAV multispectral imagery and deep learning. *Frontiers in Plant Science*, 17, 1812052.

2025 Haq, S. I. U., Wang, G., **Khan, S. N.**, Song, C., Ma, C., Zhang, X., & Lan, Y. (2025). Multi-Dimensional Optical Remote Sensing in Agriculture: Spectral, Angular, and Spatial Scaling for Crop Stress Monitoring. *Smart Agricultural Technology*, 101583.

2025 Vafaeinejad, A., Sharifi, A., & **Khan, S.N.** (2025). Robust County-Level Corn Yield Estimation Using Ensemble Machine Learning and Multi-Source Remote Sensing. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* doi:10.1109/JSTARS.2025.3585779

2025 Khan, K., **Khan, S.N.**, Ali, A., Khokar, M.F.*, & Khan, J.A. (2025). Estimating Aboveground Biomass and Carbon Sequestration in Afforestation Areas Using Optical/SAR Data Fusion and Machine Learning. *Remote Sensing* doi:10.3390/rs17050934

2025 **Khan, S.N.***, Iqbal, J., Khan, M.R., Malik, N.A., Khan, F.A., Khan, K., Khan, A.N., & Wahab, A. (2025). Using remotely sensed vegetation indices and multi-stream deep learning improves county-level corn yield predictions. *European Journal of Agronomy* doi:10.1016/j.eja.2024.127496

2024 Khan, K., Khan, J.A., Khokar, M.F., **Khan, S.N.**, & Iqbal, J. (2024). Estimating afforestation related forest cover change using data fusion and machine learning. *Environmental Research Communications* doi:10.1088/2515-7620/ad88e0

2024 **Khan, S.N.**, Li, D., & Maimaitijiang, M. (2024). Using gross primary production data and deep transfer learning for crop yield prediction in the US Corn Belt. *International Journal of Applied Earth Observation and Geoinformation* , 131, 103965. doi:10.1016/j.jag.2024.103965 [pdf]

2024 Kaushal, S., Gill, H. S., Billah, M. M., **Khan, S.N.**, Halder, J., Bernardo, A., ... & Sehgal, S. K. (2024). Enhancing the potential of phenomic and genomic prediction in winter wheat breeding using high-throughput phenotyping and deep learning. *Frontiers in Plant Science* , 15, 1410249. doi:10.3389/fpls.2024.1410249 [pdf]

2023 Farmonov, N., Amankulova, K., **Khan, S.N.**, Abdurakhimova, M., Szatmári, J., Khabiba, T., ... & Mucsi, L. (2023). Effectiveness of machine learning and deep learning models at county-level soybean yield forecasting. *Hungarian Geographical Bulletin* , 72(4), 383-398. doi:10.15201/hungeobull.72.4.4 [pdf]

2023 **Khan, S.N.**, Khan, A. N., Tariq, A., Lu, L., Malik, N. A., Umair, M., ... & Zawaideh, F. H. (2023). County-level corn yield prediction using supervised machine learning. *European Journal of Remote Sensing* , 56(1), 2253985. doi:10.1080/22797254.2023.2253985 [pdf]

2022 Ketchpaw, R. A., Li, D., **Khan, S.N.**, Jiang, Y., Li, Y., & Zhang, L. (2022). Using structure location data to map the wildland-urban interface in Montana, USA. *Fire, 5*(5), 129. doi:10.3390/fire5050129 [pdf]

2022 **Khan, S.N.**, Li, D., & Maimaitijiang, M. (2022). A Geographically Weighted Random Forest Approach to Predict Corn Yield in the US Corn Belt. *Remote Sensing, 14*(12), 2843. doi:10.3390/rs14122843 [pdf]

2021 Ahmad, W., Iqbal, J., Nasir, M. J., Ahmad, B., Khan, M. T., **Khan, S.N.**, & Adnan, S. (2021). Impact of land use/land cover changes on water quality and human health in district Peshawar Pakistan. *Scientific Reports, 11*(1), 1-14. doi:10.1038/s41598-021-96075-3 [pdf]

2020 Khan, K., Iqbal, J., Ali, A., & **Khan, S.N.** (2020). Assessment of Sentinel-2-Derived Vegetation Indices for The Estimation of Above-Ground Biomass/Carbon Stock, Temporal Deforestation and Carbon Emissions Estimation in the Moist Temperate Forests of Pakistan. *Applied Ecology and Environmental Research*, *18(1)*, 783-815. doi:10.15666/aeer/1801_783815 [pdf]

2018 **Khan, S.N.**, Mir, K., Tahir, A., Awan, A., Nisa, Z. U., & Gillani, S. A. (2018). Allocation of Tutors and Study Centers in Distance Learning Using Geospatial Technologies. *ISPRS International Journal of Geo-Information*, *7(5)*, 185. doi:10.3390/ijgi7050185 [pdf]

Refereed Conference Proceedings

2024 Janjua, U. U. R., Maimaitijiang, M., Millett, B., Yabwalo, D., Dilmurat, K., **Khan, S.N.**, Billah, M.M., Shires, M., Sehgal, S.K., & Ali, S. (2024). "Wheat Fusarium Head Blight Disease Severity Estimation using UAS Multispectral Imagery and Machine Learning". In *2024 International Conference on Frontiers of Information Technology (FIT)* (pp. 7-12). IEEE.

2024 Khan, K., Khokar, M.F., **Khan, S.N.**, & Khan, J.A. (2024). "Characterizing Forest Cover Dynamics in the Khyber Pakhtunkhwa Region Using Remote Sensing". In *2024 International Conference on Frontiers of Information Technology (FIT)* (pp. 7-12). IEEE.

2023 **Khan, S.N.**, Maimaitijiang, M., Millet, B., Paheding, S., Li, D., Caffé, M., & Kovács, P. (2023). "Simultaneously Estimating Crop Yield and Seed Composition Using Multitask Learning From UAV Multispectral Data". *2023 IEEE International Geoscience and Remote Sensing Symposium IGARSS* doi: 10.1109/IGARSS52108.2023.10282273

2023 Maimaitijiang, M., Millet, B., Paheding, S., **Khan, S.N.**, Dilmurat, K., & Kovács, P. (2023). "Estimating Crop Grain Yield and Seed Composition Using Deep Learning from UAV Multispectral Data". *2023 IEEE International Geoscience and Remote Sensing Symposium IGARSS* doi: 10.1109/IGARSS52108.2023.10281802

Media Coverage

2022 "Drone technology reaches new heights at SDSU". Keloland Media Group, September 05, 2022. (Reporter: Ariana Schumacher). [Video]

2022 "South Dakota State researchers using drones to aid precision agriculture". Dakota News Now, September 15, 2022. (Reporter: Cooper Seamer). [News Link]

PRESENTATIONS

General Presentations

2019 Khan, S,N. “GeoInformatics Serves the Belt and Road”. *International Summer School*, Central South University, Changsha, PRC.

Conference Presentations

2023 Khan, S.N. “Simultaneously Estimating Crop Yield and Seed Composition Using Multitask Learning From UAV Multispectral Data”. *International Geoscience and Remote Sensing Symposium (2023)* , Pasadena, California, U.S.A.

2022 Khan, S.N."Spatially explicit machine learning to predict county-level corn yield in US Corn Belt". *Black Hills Digital Mapping Conference (October 17th 2022)* , Rapid City, South Dakota, U.S.A.

2022 Khan, S.N."County-level Crop Yield Prediction Using Machine Learning". *AAG Annual GPRM Meeting (October 15th 2022)* , Denver, Colorado, U.S.A.

2022 Khan, S.N, Li, D. Maimaitijiang, M."Corn yield prediction using geographically weighted machine learning". *53rd Geography Convention (March 31st - April 1st 2022)* , Brookings, South Dakota, U.S.A.

Conference Poster Presentations

2022 Khan, S.N. Li, D. "County-level Corn and Soybean Yield Prediction Using MODIS-derived Primary Production and Deep Learning". *Earth Resources Observation and Science (EROS), USGS, Poster Competition (November 16th 2022)* , Sioux Falls, South Dakota, U.S.A.

2022 Khan, S.N, Maimaitijiang, M, Li, D."Corn yield prediction with machine learning using remote sensing, climate, and soil data ". *53rd Geography Convention (March 31st - April 1st 2022)* , Brookings, South Dakota, U.S.A.

TEACHING

Teaching Experience

UG = undergraduate, MS = master's

National University of Sciences and Technology (NUST) Assistant Professor, 2025 – present

Fall 2026 Web GIS MS · Spatial Decision Support System UG

Spring 2026 GIS Programming UG · Introduction to Data Science UG

Fall 2025 Web GIS MS · Spatial Data Analysis UG

The University of Alabama 2023 – 2025

Spring 2025 Introduction to Unmanned Aerial Systems (UAS) *(Instructor of record)*

Summer 2024 Introduction to Unmanned Aerial Systems (UAS) *(Instructor)*

Fall 2023 – Fall 2024 Geographical Information Systems · Remote Sensing I *(Teaching Assistant)*

National University of Sciences and Technology (NUST) Lecturer, 2018 – 2020

Fall 2020 CS-471 GIS Programming · GIE-306 Cartography and Map Production · CS-340 Web Technologies

Spring 2020 CS-471 Machine Learning (co-taught with Ms. Quratulain) · GIE-409 Spatial Databases

Fall 2019 GIE-471 GIS Programming · CS-250 Data Structures and Algorithms

Spring 2019 CS-212 Object Oriented Programming · GIE-409 Spatial Databases

Fall 2018 CS-110 Fundamentals of Programming · GIE-321 Database Management Systems

AWARDS & HONORS

Poster Awards

2023 First place in Graduate Students Poster Competition, Geography Convention (March 31st to April 01, 2023), South Dakota State University, Brookings, SD

2022 First place in Graduate Students Poster Competition, Geography Convention (March 31st to April 01, 2022), South Dakota State University, Brookings, SD

Travel Awards

2024 Graduate School Travel Award, The University of Alabama (For attending the AGU 2024 Annual Meeting in Washington, DC)

2024	Department of Geography and the Environment Travel Award, The University of Alabama (For attending the AGU 2024 Annual Meeting in Washington, DC)
2023	Travel Award for attending 2023 South Dakota Water Conference October 9 - October 11, held in Brookings, SD
2023	Graduate School Travel Award (For attending and presenting at 2023 IGARSS Conference in Pasadena, CA)
2023	American Association of Geographers (AAG) Travel Award (For attending AAG 2023 Annual Meeting in Denver, CO)
2019	Young Teacher Travel Award, Central South University, Changsha, China

Scholarships

2021	Higher Education Commission Scholarship for PhD Studies in USA under US Pakistan Knowledge Corridor Program
2021	Graduate Research Assistantship, South Dakota State University, USA
2016	ICT R&D Scholarship for high achieving Master's Students at NUST, Pakistan
2012	Scholarship for Undergraduate studies in NUST, Pakistan

Other Awards

2023	Best Graduate Student of the year, Department of Geography and Geospatial Sciences, South Dakota State University
2025	David C. Weaver Memorial Award, Awarded by Department of Geography and the Environment, The University of Alabama.

SKILLS

Programming Languages	Python, C/C++, R
GIS/Remote Sensing Tools	ArcMap, ArcGIS Pro, ArcPy, ENVI, ERDAS IMAGINE, QGIS, Google Earth Engine
Machine Learning/Deep Learning	Scikit-learn, Keras, Pandas, Numpy, GeoPandas
Open Source Geospatial Tools	GDAL/OGR, OpenTools, PROJ.4, RasterIO, ArcPy
WebGIS Development	OpenLayers, Leaflet, GeoServer, PostGIS
Database Skills	PostgreSQL/PostGIS, SQL Server, DB2, MySQL
Agent-Based Modeling	GAMA Platform