Nirajan Tripathi

GIS Analyst · Geospatial Data Scientist · Remote Sensing

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Portfolio | LinkedIn | GitHub

SUMMARY

GIS analyst and geospatial data professional with 4+ years across spatial analysis, remote sensing, and field surveying, plus graduate research in hydroclimatology. I build reproducible, end-to-end spatial-ML and remote-sensing workflows in Python, Google Earth Engine, and PostGIS, with honest validation and code others can run. Recent work includes a utility-scale solar-siting model validated at 0.92 spatial cross-validated ROC-AUC and an urban-heat analysis across 65 neighborhoods. Seeking geospatial data scientist, GIS analyst, or GIS developer roles in energy, environment, water resources, and planning.

TECHNICAL SKILLS

Spatial ML & Data: Python (scikit-learn, GeoPandas, Rasterio, pandas, NumPy, ArcPy), R (tidyverse, sf), spatial cross-validation, SHAP, statistical modeling

Remote Sensing: Google Earth Engine, Landsat / Sentinel, NDVI / LST, land-cover classification, ERDAS IMAGINE

Spatial Databases & GIS: PostgreSQL / PostGIS, spatial SQL, ArcGIS Pro, ArcGIS Online, QGIS, ModelBuilder

Web Mapping & Tools: Leaflet, GeoJSON, JavaScript, Git / GitHub, reproducible project structure

Surveying & Field: GNSS / DGPS, UAV / drone mapping, Pix4D

SELECTED PROJECTS

Utility-Scale Solar Siting ML (TX → NC Transfer) *Python · scikit-learn · Earth Engine · SHAP*

- Built a presence-background Random Forest model of where utility-scale solar is sited across Texas; found **distance to transmission infrastructure predicts siting roughly 9× more strongly than solar irradiance**, overturning the assumption that sunshine drives siting.
- Validated with a full spatial cross-validation ladder (**0.92 spatial-block ROC-AUC**, leave-one-region-out 0.91) and confirmed feature importance with SHAP and Boruta across 10 replicate draws.
- Transferred the Texas-trained model to North Carolina (ROC-AUC 0.76), localizing where siting is policy-driven rather than physics-driven; published with reproducible code and an Area-of-Applicability mask.

Austin Urban Heat Island Story Map *Earth Engine · PostGIS · R · Leaflet*

- Measured summer land surface temperature across all 65 Austin neighborhoods from Landsat 8/9 thermal imagery in Google Earth Engine; quantified strong correlations with tree canopy (**r = −0.87**) and impervious surface (**r = +0.83**).
- Joined U.S. Census tract income to neighborhoods via an **area-weighted PostGIS spatial join** (coordinate reprojection, geometry validation) and published the analysis as an interactive scrollytelling web map.

Rooftop Solar Across Data Environments *Python · LiDAR · ArcGIS Pro*

- Ran one identical rooftop-solar method on 1 m airborne LiDAR (Austin) and a 30 m open DSM (Kathmandu) to **quantify how elevation-data resolution systematically biases** solar estimates (roof slope flattened 40° to 4°; 87% of small buildings dropped at 30 m).

Watershed Land-Cover Simulation (Markov-CA) *Python · ArcGIS Pro · NLCD*

- Built a Markov chain–Cellular Automata model that learns 2010–2020 land-cover transitions and forecasts San Antonio urban growth to 2030, **validated at a Figure of Merit of 0.85** against a persistence baseline.

Transit Dependency Likelihood Index, Portland *ArcPy · Network Analyst*

- Developed a custom ArcPy tool combining demographic need with transit service areas (z-scores, VIF screening) to identify high-need neighborhoods underserved by bus stops.

EXPERIENCE

Graduate Research Assistant · *Texas State University, San Marcos, TX* Jan 2025 – Present

- Conducting M.S. thesis research on Texas Hill Country streamflow; found **precipitation–discharge decoupling**, with discharge collapsing 45–96% at most gauges while rainfall stayed near long-term normal, isolating climate change as the primary regional driver after ruling out reservoirs, urbanization, and brush encroachment.
- Analyze hydroclimatic variability and trends with Python and R (statistical and time-series methods) across multi-source national climate and hydrologic datasets.
- Build reproducible data-processing workflows that improve consistency and repeatability across multi-decade analyses.

Geomatics Engineer · *Pokhara Metropolitan City, Gandaki, Nepal* Nov 2023 – Jun 2024

- Conducted GNSS and UAV surveys for river, terrain, and surface-water analysis supporting municipal flood-risk assessment.
- Mapped multi-temporal water-extent change in Fewa Lake and set high-flood-level benchmarks used in urban flood-risk planning.

GIS Analyst · *Earth Eco Consultancy, Gandaki, Nepal* Jun 2021 – Oct 2023

- Performed multi-criteria suitability analysis (MCDA) for land-use planning and built a wildfire-risk model for Banke National Park used to support fireline planning.
- Delivered DGPS cadastral and land-pooling surveys and municipal-scale thematic mapping for planning and stakeholder reporting.

EDUCATION & AWARDS

M.S. Geography, Texas State University *(GPA 3.84 / 4.0)* Aug 2024 – Expected May 2026

Awards: The Graduate College Scholarship (2026); Joe & Jerry Moore Scholarship (2025); TSUS Graduate Endowed Fellowship (2024 & 2025); TXST Graduate Merit Fellowship (2024).

B.S. Geomatics Engineering, Tribhuvan University, Nepal Aug 2016 – Apr 2021