Pratikshya Regmi
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EDUCATION

- **Ph.D.** - In Progress
  Center For Geospatial Analytics, North Carolina State University, 2025.
  - Major: Geospatial Analytics
  - Dissertation: Developing a reproducible methodology to fuse LiDAR, UAS, and satellite imagery for monitoring post-disaster geomorphic change.
    - Advisor: Dr. Helena Mitasova
- **M.S.**
  Geospatial Systems Engineering, Texas A & M University- Corpus Christi, 2023.
  - Thesis: *Application of UAS photogrammetry and geospatial AI techniques (training and finetuning deep learning models) for palm tree detection and mapping*
    - Advisor: Dr. Michael J. Starek
- **BE**
  Geomatics Engineering, Kathmandu University, School of Engineering, Dhulikhel, Kavre 2018.
  - Thesis: *Analyzing the Effect of Image Overlap, Number of GCPs & its Distribution Pattern on Overall Accuracy of UAV Photogrammetry*
    - Advisor: Dr. Uma Shankar Panday

POSITIONS AND AFFILIATIONS

- **Graduate Research and Teaching Assistant, North Carolina State University (NCSU)**
  - GeoForAll lab Center for Geospatial Analytics. 2023-Present
    - Built spatio-temporal Earth observation pipelines for post-disaster mapping using multi-temporal lidar (2017/2020/2024), SfM point clouds, and imagery (NAIP/Planet; Sentinel-derived NDVI).
    - Quantified terrain change (DEM of Difference) and mapped erosion/deposition patterns; produced map-ready outputs for hazard interpretation and recovery planning.
    - Modeled drainage and flow-path change using GRASS GIS terrain/hydrology tools and automated key steps in Python for reproducible reruns.
    - Developing clean, reusable research code and documentation in GitHub (scripts/notebooks, version control, issue tracking) to support open and repeatable analysis.
    - Prototyping an LLM-assisted geospatial workflow that connects natural-language requests to GRASS GIS tools via structured tool/function calling and documentation retrieval.
- **Summer Research Assistant, NCSU**

- Institute for Transportation and Research education. June 2024-Aug 2024.
    - Parachute integration and deployment in Mavic drones for operations over people waiver; Visibility analysis for safe UAS operation.

- **Graduate Research Assistant, Texas A & M University- Corpus Christi (TAMUCC)**
    - MANTIS lab, Conrad Blucher Institute for Science and Technology. 2021-2023.
        - Conducted UAS flights, processed imagery, developed 2D/3D web maps and dashboards in ArcGIS Online, and maintained TAMUCC's historic UAS imagery site using ArcGIS online.

- **Geomatics Engineer, NEA Engineering Company Limited, Kathmandu Nepal (Jan 2021-July 2021)**
    - Performed GIS mapping and satellite-based analysis to optimize transmission line routes for minimal cost, shortest path, and maximum community benefit.

HACKATHON

SAFE - MCP (an open source security framework project for documenting and mitigating threats in the Model Context Protocol (MCP) ecosystem.)- 2025- By Aastha.ai (a weekly hackathon) https://github.com/SAFE-MCP/safe-mcp

- Contributed to SAFE-MCP, an open-source project focused on documenting threats and mitigations for tool-using LLM systems.
- Wrote security technique documentation (threat scenario → risk → mitigations/detections) and improved references for clarity and reuse.
- Collaborated through GitHub PRs using clean version control practices (branches, reviews, updates based on feedback).

NC PSI Hackathon- 2025 – **Advanced Track Winner https://cnr.ncsu.edu/geospatial/news/**

- Developed ML models combining historical/current climate data to identify North Carolina's top five climate-suitable crops, predict crop yields, and detect major historical crop-failure events: optionally improved accuracy by integrating advanced soil metrics. https://github.com/Pratikshya-Regmi/PSI_Grow_Thy_HackPack

NC PSI HACKATHON- 2024- Beginners Track (Participant)

- Distinguished crops from weeds by annotating 400 images in Roboflow; trained and evaluated deep learning models (including YOLO) to improve prediction accuracy.

HONORS AND AWARDS

- Women in GIS Award- Women in GIS. 2025
- University Graduate Fellowship (Extraordinary incoming PhD student) - North Carolina State University. 2023
- C.J. Davidson Scholarship - Texas A&M University-Corpus Christi. 2023
- C.J. Davidson Scholarship - Texas A&M University-Corpus Christi. 2022
- Conrad Blucher Institute Scholarship - Conrad Blucher Institute. 2022
- Geospatial Surveying Engineering Scholarship - Texas A&M University-Corpus Christi. 2022

- ASPRS Student Conference Presentation Grant - American Society for Photogrammetry and Remote Sensing. 2022
- ·C.J. Davidson Scholarship- Texas A&M University–Corpus Christi. 2021
- Geospatial Surveying Engineering Scholarship Texas A&M University-Corpus Christi. 2021
- Best Paper Presented - Unmanned Aerial System in Geomatics Conference, IIT Roorkee, India · Jan 2019.

WORKSHOPS

- Hosted two-hour clinic at CSDMS annual meeting 2025(Intro to GRASS GIS and Tangible Landscape- 2025, UC Boulder, Colorado) https://cnr.ncsu.edu/geospatial/news/2025/06/23/center-ph-d-students-engage-global-audience-with-grass-gis-and-tangible-landscape-workshop/ (https://github.com/ncsu-geoforall-lab/csdms-grass-2025)

- Hosted 2-hour GRASS GIS clinic at CSDMS annual meeting (Coastal evolution analysis and inundation modeling with GRASS GIS using Jupyter Notebook- Montclair State University, New Jersey) https://cnr.ncsu.edu/geospatial/news/2024/06/03/students-teach-grass-gis/ (https://github.com/ncsu-geoforall-lab/csdms-grass-2024)

PRESENTATIONS

- Geomorphic Impacts and Terrain Recovery After Hurricane Helene: A Multi-Sensor Geospatial Analysis in Western North Carolina (AGU 2025, New Orleans, Louisiana)

- Accessing the Potential of Large Language Models (LLMs) for Geospatial Analysis (IALE NA 2025, Raleigh, North Carolina)

- Visibility Analysis for Safe UAS Operation (AGU 2024, Washington D.C.)

- Simulating Wildfire Ash Transport Following a Precipitation Event by Coupling Dorado and Overland Flow (CSDMS Fall Webinar 2024 Series- Virtual)

- Overview of the Uncrewed Aircraft System (UAS) Campus Survey Project at Texas A&M University-Corpus Christi (Presented at FIG Working Week 2023, Orlando, Florida)

- Application of Uncrewed Aircraft Systems (UAS) Surveying and Geospatial AI to Detect and Monitor Palm Trees (TAMUCC Symposium, 2023)

- A Historical Perspective of UAS Monitoring for Campus Facilities and Geo-informatics at Texas A&M University-Corpus Christi (Student Presentation Grant on ASPRS Annual Conference 2022, Denver Colorado)

- Analyzing the Effect of Distribution Pattern and Number of GCPs on Overall Accuracy of UAV Photogrammetric Results (Best paper presented on UASG-2019, IIT, Roorkee, UP, India)

TECHNICAL SKILLS

- Programming: Python, R
- Deep Learning / ML: model training & evaluation; computer vision (YOLO); familiarity with transformers / self-supervised learning concepts
- Earth Observation / Remote Sensing: satellite imagery analysis; time-series indices (NDVI); change detection; LiDAR & point-cloud workflows; photogrammetry (SfM)
- Geospatial Tools: GRASS GIS, ArcGIS Pro, ArcGIS Online, QGIS, Google Earth Engine
- Photogrammetry / Point Clouds: Agisoft Metashape, Pix4D, CloudCompare
- ML Engineering / Reproducibility: Git/GitHub (branches, PRs), JupyterLab, LaTeX
- Open-source & AI safety: contributions to open-source geospatial tooling; SAFE-MCP documentation/security work for tool-using AI systems.

PUBLICATIONS AND PRESENTATIONS

Regmi, P., Mitasova, H. (2024). Visibility Analysis for Safe UAS Operation Using Lidar Datasets. Presented at the American Geophysical Union (AGU) Annual Meeting.

Regmi, P. (2023). *Application of UAS Photogrammetry and Geospatial AI Techniques for Palm Tree Detection and Mapping*. Master's Thesis, Texas A&M University-Corpus Christi.

Regmi, P., Starek, M. J., & Berryhill, J. (2023). Overview of the Uncrewed Aircraft System (UAS) Campus Survey Project at Texas A&M University-Corpus Christi. FIG Working Week 2023.

Regmi, P., Starek, M. J., & Berryhill, J. (2022). A Historical Perspective of UAS Monitoring for Campus Facilities and Geoinformatics at Texas A&M University-Corpus Christi. ASPRS 2022 Annual Conference.

Regmi, P., & Wagle, N. (2021). Encroachment of Forest Cover in Chitwan and Parsha Districts of Nepal: A Spatiotemporal Quantification Over 25 Years. Journal of Land Management and Geomatics Education, 3, 7–12.

Awasthi, B., Karki, S., **Regmi, P**., Dhami, D. S., Thapa, S., & Panday, U. S. (2020). Analyzing the Effect of Distribution Pattern and Number of GCPs on Overall Accuracy of UAV Photogrammetric Results. In Proceedings of UASG 2019: Unmanned Aerial System in Geomatics, 1, 339–354.

Awasthi, B., Karki, S., **Regmi, P**., Dhami, D. S., Thapa, S., & Panday, U. S. (2019). Assessing the Overall Accuracy of UAV Photogrammetry: A Methodology for Different Combination of Imagery Parameters and Terrain Types. Journal of Land Management and Geomatics Education, 1, 22–32.

PROFESSIONAL SERVICE

- AGU H3S Sub Committee (Member, 2025-2026)
- Nepali Student Association (NSA) NCSU (Vice President, 2025-Present)
- Geospatial Graduate Student Organization (GGSO) (External Affairs Officer, 2024-2025)
- American Geophysical Union (AGU) (Member, 2024-Present)
- American Society for Photogrammetry and Remote Sensing (ASPRS) (Member, 2023-2024)

VOLUNTEERING

STEM RESOURCE FAIR FOR K-12 STUDENTS WITH DISABILITIES AT NORTH CAROLINA STATE UNIVERSITY (2024 AND 2025) Featured an interactive activity where students used blocks to learn about satellite imagery and its wide applications.

LICENCES AND CERTIFICATIONS

- AUVSI Trusted Operator, AUVSI. May 2025
- FAA Part 107 Certified sUAS Remote Pilot, FAA. Jul 2024
- Spatial Data Science: The New Frontier in Analytics, Esri. Nov 2022
- ArcGIS Notebooks Basics, Esri. Jun 2022
- Data Science Workflows Using ArcGIS Notebooks, Esri. Jun 2022
- Introduction to ArcGIS API for Python, Esri. Jun 2022
- Introduction to Regression Analysis Using ArcGIS Pro, Esri. Jun 2022
- Mapping Clusters: Hot Spot & Outlier Analysis, Esri. Nov 2021
- Crime Analysis: Tactical and Strategic, Esri. Oct 2021
- Optimal Facility Location Using ArcGIS Pro, Esri. Oct 2021
- Introduction to the Crime Analysis Solution, Esri. Oct 2021
- Space-Time Analysis: Time-Series Clustering, Esri. Sep 2021
- Capstone: Retrieving, Processing & Visualizing Data with Python, Univ. of Michigan. Feb 2021
- Machine Learning, Stanford University (Andrew Ng). Oct 2020
- Neural Networks and Deep Learning, DeepLearning.AI (Andrew Ng). Oct 2020
- Python Data Structures, University of Michigan. Oct 2020
- Python for Everybody: Getting Started, University of Michigan. Sep 2020