Palak Agarwal

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Dynamic and detail-oriented Geospatial Data Scientist with expertise in spatial analytics, machine learning, AI, and data visualization. Experienced in leveraging Python, GIS, Google Earth Engine(GEE), and statistical modeling to drive impactful insights for public policy, environmental sustainability, and infrastructure planning. Passionate about using data-driven solutions to address global challenges, collaborating with stakeholders, and developing innovative tools to support decision-making.

PROFESSIONAL EXPERIENCE

Institute for Development Impact, Washington DC　　　　　　　　　　　　　　　**May 2023 – Jan 2025**
Geospatial Data Scientist

- Designed a new data management system for the Philippine Rice Research Institute (PhilRice), optimizing insights for sustainable rice production.
- Designed and implemented a Living Income Benchmark tool in collaboration with the Bill and Melinda Gates Foundation and Mars, improving income transparency for 15000+ farmers in India while promoting women empowerment and sustainable supply chains.
- Engineered an [AI-driven application](#) using Django with LLM agents (Llama and Mistral) to extract insights from 20,000+ domain-specific documents, streamlining knowledge management.
- Built ETL pipelines using Git and Python to integrate climate, education, and socio-economic data, supporting predictive analytics dashboard. Collaborating with the GREEN network, B2E, UCLA, and other thought partners to create dialogue and conversations around the topic.
- Conducted quarterly field evaluations to generate key performance indicators (KPIs) for measuring economic and social impact.
- Consulted with 6500+ farmers across the globe on carbon accounting tools and sustainable agricultural practices.

US Ignite, Washington DC　　　　　　　　　　　　　　　　　　　　　　　　　　**July 2021 – May 2023**
Geospatial Data Scientist

- Developed geospatial solutions for the U.S. Department of Defense (DoD) and ERDC (US Army Corps of Engineers), optimizing traffic management, energy efficiency, and heat mitigation strategies.
- Designed an award-winning [Intelligent Infrastructure Dashboard](#) (Topio Networks, 2023) for Fort Carson, using Poisson regression modeling to assess road safety under weather conditions.
- Developed an energy and power management dashboard for ERDC & Fort Moore, optimizing energy efficiency and preventing failures.
- Collaborated with the city and county of Miami-Dade to develop an [economic recovery tool](#) offering real-time economic strategies to community leaders recovering from COVID-19. Modeled the Quarterly Unemployment Forecast through an exploration of time series, cross-sectional, and deep learning models with an accuracy of 90%.
- Built a National Broadband Analysis Tool, using clustering & time-series modeling to predict broadband access as a function of socioeconomic health. Experimented with multiple clustering methodologies and validated them through a benchmark analysis to ensure generalizability and accuracy.
- Mentored and guided 5+ graduate capstone teams, advancing data processing and modeling techniques.

Biohabitats, Denver　　　　　　　　　　　　　　　　　　　　　　　　　　　　**Jan 2022 – July 2022**
Carbon Accounting Researcher

- Evaluated carbon accounting tools for landscape architecture and ecology applications.
- Built an ArcGIS-integrated carbon accounting tool, improving visualization capabilities and reducing carbon accounting analysis by 30%.

University of Pennsylvania
Research Assistant, Ian McHarg Center　　　　　　　　　　　　　　　　　　　**Jan 2020 – July 2021**

- Proposed and spearheaded a [research project](#) linking US domestic policy to global climate change effects.
- Developed interactive geospatial visualizations using Python & ArcGIS Pro, improving accessibility and understanding of complex datasets.

Teaching Assistant, Media III: Flows(linear/non-linear)　　　　　　　　　　　**Aug 2020 – Dec 2020**

- Instructed 45+ students in ArcGIS Pro, Rhino, Grasshopper, and Adobe Suite.

Research Assistant　　　　　　　　　　　　　　　　　　　　　　　　　　　　　**Jan 2021 – July 2021**

- Utilized ArcGIS Pro, ModelBuilder, and Python to analyze Sentinel images to generate [multi-spectral signatures](#) and match it to the spectral signature of different land cover types for classification.
- Deployed an automated classification tool on Google Earth Engine for real-time updates.

Reed Gilliland Landscape Architecture, Petaluma, CA   **May 2019 – Aug 2019**
Summer Design Intern
- Assisted in designing of residential projects through conceptual and construction development phases.
- Proposed conceptual design and developed 3D models using Rhino for two competition proposals.

Bhumiputra Architecture   **July 2016 - June 2018**
Architect
- Designed 20+ prototypes of varied functions for underprivileged communities, analyzing demographics & socio-economic factors for optimal site selection.
- Contributed to National War Museum, India design competition; project shortlisted in top 8.
- Supervised and assisted in designing of residential and commercial projects through conceptual and construction development phases.

EDUCATION

University of Pennsylvania, School of Design   **Aug 2018 - May 2021**
Master of Urban Spatial Analytics (MUSA)
Master of Landscape Architecture and Regional Planning (MLA)

Rashtreeya Vidyalaya College of Architecture, Bangalore, India   **Aug 2012 - July 2017**
Bachelors of Architecture

LEADERSHIP & SERVICE

PlanetSampling   **Oct 2024 – Present**
Geospatial Data Scientist Volunteer
- Developed a geospatial analysis framework using Python and GEE to map and assess wildfire damage in Los Angeles, focusing on burned areas, vegetation, and affected infrastructure for immediate short-term relief and planning.

Humanitarian OpenStreetMap Tasking   **July 2023 – Present**
Mapping Volunteer
- Partnered with the Food and Agriculture Organization (FAO) to map reservoirs in Somalia, supporting preparedness and emergency response to effects of drought.

Speaker, City of the Future Conference, Washington DC   **Jan 2023**

International Student Representative, University of Pennsylvania   **Aug 2019 - May 2020**

SKILLS

- **Geospatial Analytics:** ESRI ArcGIS Enterprise, ArcPy, Google Earth Engine, Environmental Modeling, QGIS, Python
- **Programming & Scripting:** Python, R Studio, JavaScript, HTML, C++, SQL, Git
- **Machine Learning & AI:** Predictive Modeling, Spatial Statistics, Deep Learning, Artificial Intelligence
- **Data Visualization:** ArcGIS, Tableau, Power BI, Adobe Suite, Python
- **Satellite Imagery & Remote Sensing:** Image Processing, GEE, ArcGIS Spatial Analytics Toolbox
- **Environmental & Sustainability:** Carbon Accounting, Renewable Energy Planning, Land Use & Restoration
- **Soft Skill:** Leadership, Communication, Public Speaking, Problem Solving, Teamwork, Goal Setting, Delegation