**CHINNA SUBBARAYA SIDDHARTH RAMAVAJJALA**

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**PROFESSIONAL EXPERIENCE**

**National Renewable Energy Laboratory** **(NREL)** **April 2023 - Present**

*Geospatial Science Researcher – II* Madison, Wisconsin

* Designed and implemented a scalable, low-latency NoSQL solution for LiDAR data management, optimizing geospatial big data processing and reducing data storage costs by 40%.
* Developed RDIpy, a Python library, to generate high-resolution Digital Surface Models (DSMs) from LiDAR data, improving data accessibility and processing efficiency.
* Managed geospatial data using MongoDB for LiDAR and RasDaMan for raster datasets, integrating AWS Lambda for DSM computations to enhance processing scalability.
* Processed 3.2 million LiDAR tiles from USGS, generating 2.3 million DSMs covering nearly 1 million square miles under the Research Data Infrastructure and PV Rooftop Technical Potential initiative.
* Led the development and management of "Siting Lab", a high-impact renewable energy siting data platform, facilitating geospatial data dissemination under OEDI.
* Contributed to the U.S. PV Rooftop analysis effort by developing and publishing a geospatial big data product, “Developable Planes” for individual buildings.
* Implemented Spatio-Temporal Asset Catalog (STAC) for geospatial data access, designing a FastAPI without a backend on a flat-file system to improve the discoverability of 46 TB of raster data.
* Executed large-scale geospatial analysis on high-performance Linux-based computing systems, processing terabytes of spatiotemporal HDF datasets for advanced analytics.

**Wisconsin Sea Grant Institute**  **Feb 2023 – April 2023**

*Graduate Project Assistant* Madison, Wisconsin

* Developed meticulous data migration solutions for Great Lakes ArcGIS Story Map Series to ArcGIS Experience Builder. Designed user interface (UI) interactive wireframes and delivered map user experience (UX) improvement solutions resulting in a 30% increase of website outreach.

**University of Wisconsin – Madison Extension**  **May 2022 - September 2022**

*GIS Analyst Intern* Green Bay, Wisconsin

* Conducted food desert and road network analysis, achieving a 20% reduction in food access disparities with USDA norms.
* Developed a web interface usingArcGISonline for community gardens using reverse geocoding with **Google Maps API**, and improved gardener reallocation by 3% through network analysis.
* Compiled and managed a POI food source database, creating a public interactive map with Google My Maps, which garnered over 54,000 views, utilizing Google Sheets for real-time data management.
* **Collaborated with UW-Madison Brown County Extension** and officials from **four county governments (Brown, Kewaunee, Door, and Manitowoc)** to support **food accessibility and GIS-driven decision-making.**

**Wisconsin Geological and Natural History Survey (WGNHS)**  **April 2022 - September 2022**

*GIS Database Assistant* Madison, Wisconsin

* Designed spatial database using ArcSDE and achieved attribute editing for 10,000 lead and zinc mines of southwestern Wisconsin counties using legacy raster data utilizing ArcPy. Synchronized geologic information for USGS data preservation project and contributed to Wisconsin’s Mineral Development Atlas (MDA).

***Larsen & Toubro Infotech***  **January 2019 - January 2021**

**Software Engineer – GIS** Mumbai, India

* Led a geospatial data management project, overseeing shapefile creation and polygon boundary formulation, improving data organization efficiency by 30%.
* Performed geo-tagging and data digitization using QGIS and SQL, enhancing data discoverability by 35%. Conducted functional testing of the Mosaic automation tool, reducing geo-tagging query time by 2 minutes.
* Implemented data quality assurance and control measures using Python, reducing error rates by 16% through a keyword-based error mitigation strategy.

**PROJECTS**

**Enriching Open Street Map (OSM) Road Networks with Elevation Data – osmnxelevation** December 2023

* Developed a Python wrapper to integrate high-resolution DEM data into OSM road networks, enhancing walkability and bike-ability assessments with origin-destination matrix analysis and validated the results with Google Elevation API.

**Viawind Python Package** December 2023

* Developed **viawind** is an open-source Python Package for Visual Impact Assessment (VIA) of onshore Wind Turbines.

**Cartographic generalization using Artificial Neural Networks for Polygon Datasets**  October 2023

* Created an automated polygon simplification method using ANNs and evaluated outputs with Topfer’s radical law. Presented the research at the North American Cartographic Information Society (NACIS) conference in Pittsburgh, PA.

**Geospatial Data Platform for All** September 2023

* Implemented a knowledge-graph based platform to enhance data discoverability, accessibility, and to scale complex geospatial workflows. Presented the research at the Department of Energy (DoE) Data Days conference in Livermore, CA.

**Detailed Map of Mars: The Goldilock’s Planet** May 2023

* Processed DEM data from the Mars Orbiter Mission (MOM), NASA, and created an award-winning cartographic map, recognized with the NACIS Best Cartographic Research award and the Barabara Petchnick Award for Graphic Design.

**TECHNICAL SKILLS**

**Programming Languages:** Python (Geopandas, GDAL, PDAL, OSMnx, rioxarray, rasterio), JavaScript (Leaflet, D3), SQL

**Databases**: MongoDB (PyMongo), PostGIS & PostgreSQL, ArcSDE, RasDaMan DB

**Tools:** QGIS, Linux/Unix, ArcGIS Pro, Adobe Illustrator, Docker, MapBox, GitHub, Amazon Web Services (AWS) – S3, Lambda, High-performance Computing (HPC).

**Geospatial Analyses**: Raster & Vector Bigdata, Road Network Analysis, Food Desert Analysis, Digital Terrain Analysis.

**EDUCATION**

**University of Wisconsin - Madison** **December 2023**

*Master of Science in Geographic Information Systems & Cartography* GPA: 4.00, Madison, WI

*Coursework*: GIS and Advanced Spatial Analysis, Advanced Geocomputing and Geospatial Big Data Analytics, Interactive Cartography and Geovisualization, Design and Development of Spatial Databases.

**ADDITIONAL WORK EXPERIENCE**

**University of Wisconsin - Madison** September 2022 – December 2022

**Teaching Assistant -** GIS440: Introduction of GIS – Professor A-Xing Zhu

Maps Portfolio - <https://sidrcs.github.io/maps/Maps.html/>