

LINGDUO LUO

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ABOUT ME

- **6+** years of experience with **GIS**, **4+** years of **Data Analysis**, **Python**, and **SQL**, proficient with **Geospatial Analysis**.

EDUCATION

Master of Spatial Data Science, University of Southern California August 2021 - May 2023
Relevant Coursework: Machine Learning for DS, Foundations of Data Management

Bachelor of Geographic Information Science, Sun Yat-Sen University August 2017 - June 2021

Summer Session Visitor, University of California, Berkeley July 2019 - August 2019

SKILLS

- **Programming Languages:** Python (Advanced), SQL (Advanced), JavaScript (Intermediate), R (Intermediate)
- **Data Analysis:** ETL, Machine Learning, Image Processing, Spatial Analysis, Data Modeling, Web Development
- **Tools and Technologies:** Geospatial Analysis (GeoPandas, ArcGISPro, Google Earth Engine), Tableau, SPSS, Web Scraping (BeautifulSoup, APIs, HTML), Flask, Big Data (Hadoop), Cloud Services (AWS/DynamoDB)

EXPERIENCE

Department of RS and GIS, Guangzhou Institute of Geography [\[Demo\]](#) March 2020 - December 2020
Research Assistant *Guangzhou, China*

- Developed and optimized a data pipeline using **Python**, **SQL**, and **JavaScript** to correlate urban land use changes and surface temperature, resulting in a **10x improvement** in computation speed and actionable insights.
- Implemented **ETL** processes to clean and preprocess Guangzhou hourly weather API data using **Python & SQL**, enabling efficient data analysis & visualization; **documented** solutions clearly, facilitating maintainability and further development.
- Utilized **JavaScript** to operate **Google Earth Engine**, achieving sub-pixel land use classification through a **linear mixture model**, enhancing the precision of urban planning models.
- Processed Landsat 8 Surface Reflectance data, applied cloud masks, calculated indices such as NDVI and Land Surface Temperature (LST), and **visualized** the results using **JavaScript**, providing valuable data for climate change studies.

PROJECTS

National Parks & Areas Travel Planner Web Application [\[Website\]](#) [\[Git\]](#) February 2023 - May 2023

- Developed and deployed a data-driven, user-interactive **web application** on PythonAnywhere for U.S. National Parks System travel planning, enhancing user efficiency by **20%** through simplified data integration and location insights.
- Implemented **ETL** processes using **Python** for **web scraping** and **data cleaning**, leveraging **APIs** (OpenWeatherMap API & Google Maps API) for weather forecasts and driving directions integration.
- Constructed a user-friendly website interface employing **Flask**, **HTML**, and **Python**, delivering **interactive features** such as route search, weather forecasts, and information query.
- Pursued **ongoing improvements** through design enhancements and data model expansion, enriching user experience.

Power Plant Energy Output Prediction and Analysis [\[Git\]](#) February 2022

- Leveraged **SQL** and **Python** to ingest and process 9600 records of plant operational data, enhancing the model's predictive accuracy by **15%** and supported data-driven decision making.
- Developed **ETL pipelines** to automate the data cleaning & transformation process, reducing data handling time by **10%**.
- Constructed a **multiple linear regression model**, accurately predicting the plant's hourly electrical energy output; optimized a **sklearn KNN model**, achieving **20%** testing error reduction by eliminating non-significant variables.

Medical Data Binary Classification [\[Git\]](#) Jan 2022 - Feb 2022

- Implemented **ETL pipelines** for the medical vertebral datasets using **Python** and **SQL**, enhancing data quality and reducing manual handling.

- Conducted data **pre-processing** and **exploratory analysis**, implemented a **k-nearest neighbors algorithm**, contributing to a low testing error of **8%**.

GIS PROJECTS

Healthcare Accessibility Analysis using Agent-Based Modeling (ABM) and ArcGIS [\[Git\]](#)

April 2023

- Integrated **diverse spatial datasets** in **ArcGIS** for San Francisco, including healthcare, census and socio-economic factors.
- Leveraged advanced **GIS** techniques and **NetLogo** to create an **Agent-Based Modeling (ABM) model**, simulating elderly patients' behavior and healthcare facility interactions, which informed conservation planning.
- Developed a **time-series** accessibility **map**, guiding resource allocation to improve healthcare access for elderly residents.
- Utilized **ArcGIS** and **ABM** for spatial analysis, demonstrating expertise in using GIS tools for data assessment to enhance healthcare accessibility.

Spatial Analysis of Police Violence Patterns for Enhanced Public Safety in NYC [\[Git\]](#)

February 2023

- Leveraged the crowd-sourced Fatal Encounters dataset to unveil hidden patterns of police violence across New York City.
- Used **ArcGIS** to create kernel density maps, unmasking high-incident hotspots, presenting spatial views of urban violence.
- Employed **GIS-based** Ripley's K method for spatial analysis, discerning a significant clustering of fatal encounters within a 17-unit distance and peak clustering at 6 units.
- Devised a sophisticated **spatial analysis** that accounted for background inhomogeneity, integrating population density and social vulnerability factors to refine the study's precision, demonstrated an understanding of social vulnerability factors.

Remote Sensing Analysis of Urban Decay in Northeastern China

April 2021 to July 2021

- Conducted high-throughput Remote Sensing data analytics, utilizing **MATLAB**, **Python** and **ArcGIS Pro** to identify and characterize declining urban areas.
- Innovated a city entity boundary index to precisely delineate urban locales for in-depth spatial analysis.
- Implemented **pixel-based classification algorithms** to categorize and document distinct typologies of shrinking cities.