Navid Tavakoli Shalmani

Data Engineer | Environmental data specialist

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Summary

Data Engineer with a BSc in Computer Science and an MSc in Environmental Engineering from Università di Bologna. Experienced in data analysis, machine learning, and geospatial modeling and analysis with strong expertise in Python, SQL, Tableau, and QGIS. Passionate about turning raw data into actionable insights and practical solutions that support better decision-making in environmental and urban contexts.

Experience

- **Data Engineer – Environmental and Socioeconomic Analytics — RavisCo, Iran (2019 – 2021)**
  - Built automated data pipelines and BI dashboards with Python, SQL, and Grafana.
  - Analyzed environmental and socioeconomic data to support sustainable development.
  - Performed data analysis and created tailored reports using tableau and Excel.
  - Built predictive models for cash demand forecasting to enhance resource allocation accuracy.

- **Junior Data & Sustainability Engineer — Kolbe Construction Co., Iran (2015 – 2018)**
  - Analyzed environmental and construction data to support sustainable urban development.
  - Conducted GIS-based site assessments using satellite imagery.
  - Developed predictive models to optimize building energy efficiency based on smart home data.

- **Junior Data Analyst — GSS Co, Iran (2012 – 2013)**
  - Managed data entry and ensured data accuracy across multiple sources
  - Cleaned and organized raw datasets to improve reporting efficiency.
  - Assisted in preparing monthly performance reports for management.

- **Data Analyst Intern — GSS Co, Iran (April 2012 – September 2012)**
  - Assisted in data collection, cleaning, and visualization using Excel and Python.
  - Supported team with basic data analysis and report preparation.

- **Teaching Assistant — University of Guilan, Iran (2011 – 2012)**
  - Supported teaching of computational mathematics (MATLAB, Python, numerical methods)
  - Led lab sessions, supported students in understanding programming concepts, and assessed coursework.

Education

- **MSc. Environmental Engineering** — University of Bologna, Italy (2021 – 2024)
  Advanced Deep Learning Models in Earth Observation for Urban Applications: Bologna and Turin Case Studies.

- **BSc. Civil Engineering** — Islamic Azad University, Lahijan, Iran (2013 – 2016)
  Data-Driven Assessment of Building Performance for Sustainable Construction

- **BSc. Computer Science** — University of Guilan, Iran (2007 – 2011)
  Discrete Computational Models for Urban Growth: A Data Engineering Perspective

Projects

- **TOP – Turin Open Platform** [link](#)   **LIVE DEMO**
  This project implements an automated data pipeline using Apache Airflow to extract data from Reddit, store it as CSV files, transform and combine the data, and finally load it into PostgreSQL. The workflow is designed with GDPR-awareness, ensuring proper handling and archiving of raw and processed data.

- **GDPR-Aware Reddit Data ETL Workflow (Apache Airflow, PostgreSQL)** [link](#)
  Implemented an automated ETL pipeline to extract, transform, and load Reddit data into PostgreSQL with GDPR-compliant data handling.

- **Urban Building Footprint Segmentation (Computer Vision, Deep Learning, Remote Sensing)** [link](#)
  Applied DeepLabV3 with ResNet-50 to extract urban building footprints from satellite imagery for urban planning.

- **Geostatistical Modeling and Environmental Data Analysis** [link](#)
  Geostatistically modeled ozone (O_3) density across five European countries using EEA data; cross-validated variogram models in R to select the optimum and generated kriging maps.

- **Geospatial Data Preparation for Deep Learning** [link](#)
  Developed Python scripts to preprocess and postprocess geospatial imagery, enabling clipping, tiling, CRS adjustment, format conversion, and vectorization for deep learning in remote sensing.

- **COVID-19 Data Web Scraping and Analysis** [link](#)
  Scraped global COVID-19 data from Wikipedia and performed comprehensive analysis on the collected dataset.

- **Movie Library Desktop Application** [link](#)
  Built a desktop application for managing a personal movie library with search, filter, and full CRUD functionality via a modern UI.

Language:

- **English** (Advanced)
- **Italian** (Elementary)
- **Persian** (Native)

Skills

- Programming: Python, R, MATLAB, SQL
- Data Engineering & Cloud: ETL pipelines, Apache Airflow, Docker, AWS, PostgreSQL, MariaDB, PostGIS
- Big Data & Streaming: Apache Spark, Apache Flink, Apache Kafka, ClickHouse, Elasticsearch
- Geospatial Tools: GIS (QGIS), GDAL, Remote Sensing
- Computer Vision & Machine Learning: OpenCV, TensorFlow, PyTorch, scikit-learn
- Data Analysis & Visualization: pandas, numpy, Tableau, matplotlib, seaborn
- Version Control & CI/CD: Git, GitHub Actions
- Other Tools: Git, SGems, Postgre, PostGIS

Publications

[1] Tavakoli Shalmani, N.; Arzi, F. Geostatistical Modeling of Ground-Level Ozone (O_3) in Five European Countries: Variogram Analysis and Kriging Maps, v1.0; Preprint; Zenodo: Geneva, Switzerland, 2025. https://doi.org/10.5281/zenodo.16905229. Currently under review in *Sustainability* (MDPI), Manuscript ID: sustainability-3859839.

[2] Tavakoli Shalmani, N. Advanced Deep Learning Models (DeepLabV3) in Earth Observation for Urban Applications: Bologna and Turin Case Studies; Preprint; Zenodo: Geneva, Switzerland, 2024. https://doi.org/10.5281/zenodo.16906917. Manuscript in preparation.