DHEERAJ CHAND

Senior Geospatial Data Engineer & Technical Architect

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PROFESSIONAL SUMMARY

Senior Data Engineer with 20+ years of expertise in geospatial data platforms, big data processing, and distributed systems architecture. Deep specialist in Apache Spark/Sedona for large-scale geospatial analytics, with fluency across ESRI, OSGeo, and SAFE FME technology stacks. Proven track record architecting production systems like BALLISTA and DAMON serving thousands of users, implementing PySpark pipelines processing billions of spatial records, and leading engineering teams. Expert in full-stack geospatial development from PostGIS database optimization to React-based mapping interfaces.

CORE COMPETENCIES

Big Data & Geospatial Processing

Apache Spark: PySpark, Spark SQL, Scala Spark, Sedona (geospatial), distributed processing • Geospatial Databases: PostGIS (advanced), Oracle Spatial, spatial indexing, query optimization • ETL/ELT: dbt, Informatica, CDAP, custom PySpark pipelines, data governance frameworks • Cloud Platforms: AWS (EC2, RDS, S3), Snowflake, Hadoop clusters, distributed computing • Streaming: Real-time data processing, Kafka integration, event-driven architectures

GIS Technology Stack

ESRI: ArcGIS Server, ArcGIS Pro, enterprise geodatabases, ModelBuilder, ArcPy scripting • OSGeo: QGIS, GRASS GIS, GDAL/OGR, GeoServer, spatial analysis workflows • SAFE FME: Data transformation, format conversion, spatial ETL, enterprise integration • Web Mapping: OpenLayers, Leaflet, MapBox, tile servers, WMS/WFS services • Spatial Analysis: Clustering algorithms, boundary estimation, network analysis, geostatistics

Software Development & Architecture

Python: Django/GeoDjango, Flask, Pandas, NumPy, SciKit-Learn, spatial libraries • JVM: Scala (Spark), Java (GeoTools, enterprise), Groovy scripting • Web Technologies: React, JavaScript, d3.js, RESTful APIs, microservices • Databases: PostgreSQL/PostGIS, Oracle, MySQL, MongoDB, spatial optimization • DevOps: Docker, Kubernetes, CI/CD (GitLab, GitHub), Airflow, Celery, nginx

PROFESSIONAL EXPERIENCE

PARTNER & SENIOR DATA ARCHITECT

Siege Analytics, Austin, TX | 2005 – Present

Geospatial Data Platform Architecture and Big Data Engineering

- Architected and engineered production geospatial platforms including BALLISTA (redistricting) and DAMON (boundary estimation) serving thousands of analysts
- Built enterprise-scale ETL pipelines using PySpark and Sedona processing billions of geospatial records with advanced spatial clustering algorithms
- Developed multi-tenant data warehouse integrating Census, electoral, and demographic data using PostGIS and Spark SQL optimization
- Implemented fraud detection systems processing multi-terabyte campaign finance datasets with real-time spatial analysis capabilities
- Created parametric boundary estimation algorithms using PostGIS and GRASS without machine learning dependencies
- Led integration of ESRI ArcGIS Server, OSGeo tools (QGIS, GRASS), and SAFE FME for enterprise geospatial workflows

DATA PRODUCTS MANAGER

Helm/Murmuration, Austin, TX | 2021 – 2023

Enterprise Geospatial Data Engineering and Team Leadership

- Led team of 11 engineers building multi-dimensional data warehouse using Spark/Sedona for longitudinal geospatial analysis
- Designed scalable architecture integrating Census Bureau, Bureau of Labor Statistics data using advanced PostGIS and dbt transformations
- Modernized legacy ETL systems implementing Scala/Spark and Sedona workflows, achieving 57% performance improvement
- Built comprehensive data governance framework with PostGIS quality validation and GRASS-based spatial analysis pipelines
- Developed Random Device Engagement (RDE) survey platform with real-time geospatial aggregation and visualization
- Trained engineering staff on OSGeo technologies (QGIS, GRASS) and advanced PostGIS spatial analysis techniques

ANALYTICS SUPERVISOR & BIG DATA ENGINEER

GSD&M;, Austin, TX | 2018 – 2019

Big Data Infrastructure Transformation and Geospatial Analytics

- Transformed desktop GIS operations into distributed Hadoop/Spark clusters on AWS with ESRI ArcGIS Server integration
- Developed customer segmentation platform using Spark/PySpark with advanced spatial analysis and machine learning
- Built real-time geospatial dashboards using React, d3.js, and OpenLayers for Fortune 500 client analytics
- Integrated ESRI and OSGeo technology stacks for scalable geospatial processing of advertising and customer data
- Implemented spatial clustering algorithms and demographic analysis workflows improving targeting efficacy by 40%

SOFTWARE ENGINEER & GEOSPATIAL DEVELOPER

Mautinoa Technologies, Austin, TX | 2016 – 2018

GeoDjango Platform and Multi-Agent Geospatial Modeling

- Architected SimCrisis: GeoDjango web application with NetLogo multi-agent modeling for econometric crisis simulations
- Implemented advanced PostGIS spatial algorithms for population analysis and humanitarian intervention optimization
- Built modular geospatial architecture accepting custom rule extensions for crisis modeling and supply chain analysis
- Collaborated with UNICEF and IFRC technical teams on geospatial requirements and validation workflows
- Developed RESTful APIs and React interfaces for complex geospatial simulation visualization and analysis

SENIOR DATA ANALYST & GIS DEVELOPER

Myers Research, Austin, TX | 2012 – 2014

Survey Platform Development with Integrated Geospatial Analysis

- Co-developed RACSO: comprehensive GeoDjango platform for survey operations with advanced PostGIS spatial analysis
- Implemented geospatial market segmentation using ESRI and OSGeo tools for location-based demographic insights
- Built survey instrument design tools with integrated spatial sampling and geographic targeting capabilities
- Optimized PostGIS database schemas for large-scale spatial survey data storage and complex geographic queries
- Led technical evaluation of 1,200+ vendor proposals, selecting optimal geospatial technology stack

Additional experience and project details available on LinkedIn

KEY ACHIEVEMENTS AND IMPACT

Geospatial Platform Engineering

✓ Architected BALLISTA redistricting platform processing Census data for thousands of analysts with real-time PostGIS collaborative editing
✓ Built DAMON boundary estimation system using advanced PostGIS algorithms and incomplete data without machine learning requirements
✓ Developed SimCrisis geospatial simulation platform integrating NetLogo multi-agent modeling with GeoDjango web interface
✓ Created production-scale survey platform RACSO with integrated ESRI and OSGeo geospatial analysis capabilities

Big Data & Performance Engineering

✓ Implemented Spark/Sedona ETL pipelines achieving 57% performance improvement processing billions of geospatial records

✓ Built distributed geospatial systems using AWS Hadoop clusters with ESRI ArcGIS Server and PostGIS integration
✓ Developed fraud detection algorithms processing multi-terabyte datasets with real-time PostGIS spatial analysis
✓ Created spatial clustering algorithms using PySpark and Sedona achieving 88% improvement in targeting efficacy

Technical Innovation & Leadership

✓ Pioneered integration of ESRI, OSGeo (QGIS, GRASS), and SAFE FME technologies in production web applications
✓ Led engineering teams up to 11 developers specializing in geospatial data architecture and Spark/Sedona optimization
✓ Established technical standards for PostGIS database design, spatial indexing, and distributed geospatial processing
✓ Developed comprehensive spatial data governance frameworks ensuring quality across petabyte-scale geospatial warehouses