dheeraj.chand@gmail.com
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GitHub: github.com/dheerajchand

Dheeraj Chand
[RESEARCH, ANALYSIS, ENGINEERING] → UNDERSTANDING

Austin, TX (30.2672°N, 97.7431°W)

PROFESSIONAL SUMMARY

GIS and geospatial data scientist with 15+ years building systems that matter. Discovered systematic demographic coding errors affecting 50M voters, developed geospatial ML algorithms improving classification accuracy from 23% to 64%. Expert in geospatial analysis, redistricting, and demographic modeling.

KEY ACHIEVEMENTS AND IMPACT

Algorithmic innovation: Pioneered trigonometric boundary estimation reducing mapping costs **73.5%** • **$4.7M** savings enabled nonprofit access • Breakthrough demographic discovery: Uncovered systematic voter miscoding affecting millions • **178%** accuracy improvement in racial classification algorithms

CORE COMPETENCIES

Geospatial Technologies • Programming and Development • Machine Learning & AI

PROFESSIONAL EXPERIENCE

Siege Analytics | Partner - Austin, TX 2005 - Present
Data Science & Political Analytics

• Discovered systematic race coding errors affecting **50M** voters, developed geospatial machine learning algorithms improving demographic classification accuracy from **23%** to **64%**

• Built redistricting platform used by thousands of analysts nationwide with real-time collaborative editing and Census integration

• Utilized advanced sampling methods to decrease survey margin of error from **±4.2%** to **±2.1%**, increasing voter turnout prediction accuracy from **71%** to **87%**, and ensuring survey results more closely reflected true population attitudes

• Trigonometric algorithm for boundary estimation reduced mapping costs by **73.5%**, saving campaigns and organizations **$4.7M** and enabling smaller nonprofits to conduct analysis

• Built real-time FEC analysis systems using Python, Pandas and PySpark to detect likely fraud, money laundering and financial crimes across billions of records daily, performing time series analysis on trillions of records in the political spending sub-economy valued over **$2** trillion

Mautinoa Technologies | Software Engineer - Austin, TX 2016 - 2018
Software Development

• Conceived, architected and engineered econometric simulation software for humanitarian crises intervention measurement

• Liaised with data and engineering directors at multinational NGOs (UNICEF, IFRC)

• Geospatial analysis on populations and boundaries for impact assessment

Myers Research | Senior Analyst - Austin, TX 2012 - 2014
Political Research & Analysis

• Designed comprehensive survey instruments for specialized voting segments and niche markets

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- Developed sophisticated analytical products and reports that delivered actionable insights to clients
- Co-developed a web application to manage all aspects of survey operations, from instrument design to data collection and analysis

PCCC | Research Director - Washington, DC August 2011 - August 2012
Political Research & Data Analysis (FLEEM System)

- Conceived, architected, and engineered FLEEM web application using Twilio API handling tens of thousands of simultaneous phone calls using emulated predictive dialer for regulated political surveys
- Developed IVR polling system for early quantitative research supporting Senators Martin Heinrich and Elizabeth Warren
- Built comprehensive tabular and graphical reporting system with Python, GeoDjango, PostGIS, and Apache webserver

Salsa Labs | Software Engineer - Washington, DC January 2011 - August 2011
Political Technology & CRM Systems

- Developed geospatial analysis and mapping tools for political CRM platform serving progressive campaigns nationwide
- Built database integration systems connecting voter files with campaign management tools
- Created automated data processing pipelines for voter contact and engagement optimization

KEY PROJECTS

National Redistricting Platform

About: Cloud-based GeoDjango platform for redistricting analysis with real-time collaborative editing and Census integration, used by thousands of analysts nationwide during 2021 redistricting cycle

Technologies: GeoDjango, PostGIS, AWS, Docker, React, Python, Redis

Impact: Reduced mapping costs by 73.5%, saving organizations $4.7M in operational expenses. Served 12,847 analysts across 89 organizations.

Geospatial Demographic Classification System

About: Machine learning platform for demographic analysis that discovered systematic coding errors and improved classification accuracy from 23% to 64%

Technologies: Python, Scikit-learn, PostGIS, GeoPandas, TensorFlow, AWS

Impact: Corrected demographic data affecting 50M voters nationwide, improved electoral prediction accuracy by 22%

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High-Performance Geospatial Tile Server

About: Custom tile server for Web Map Service integration enabling interactive visualization of CRM and Census data

Technologies: GeoTools, OpenLayers, Java, MySQL, TileMill, JavaScript

Impact: Improved contact rates by 53% and segmentation accuracy by 88% through enhanced data visualization

TECHNICAL SKILLS

GEOSPATIAL TECHNOLOGIES *Databases* (PostGIS, SpatiaLite, MongoDB with geospatial extensions); *Analysis Tools* (GDAL/OGR, QGIS, ArcGIS, spatial indexing, coordinate transformations); *Web Mapping* (OpenLayers, Leaflet, Mapbox GL JS, custom tile servers, WMS/WFS); *Processing* (GeoPandas, Shapely, Fiona, rasterio, spatial ETL pipelines)

PROGRAMMING AND DEVELOPMENT *Python* (15+ years: NumPy, Pandas, Scikit-learn, TensorFlow, Django, Flask, GeoPandas, Asyncio); *R* (12+ years: Statistical modeling, ggplot2, dplyr, spatial packages (sf, sp), Shiny); *SQL/PostGIS* (15+ years: PostgreSQL/PostGIS, MySQL, complex spatial queries, optimization, database design); *JavaScript* (10+ years: React, D3.js, OpenLayers, Node.js, real-time applications, WebSockets); *Java* (8+ years: Enterprise applications, Spring framework, geospatial libraries (GeoTools)); *Other Technologies* (Shell scripting, Git, Docker, Kubernetes, infrastructure as code)

MACHINE LEARNING & AI *ML Frameworks* (Scikit-learn, TensorFlow, PyTorch, XGBoost, LightGBM); *Geospatial ML* (Spatial feature engineering, geographically weighted regression, spatial clustering); *Techniques* (Classification, regression, ensemble methods, time series, NLP, computer vision); *Validation* (Cross-validation, A/B testing, statistical significance, model interpretability)