

PROFESSIONAL SUMMARY

Senior data scientist and software engineer specializing in geospatial machine learning and large-scale demographic analysis. Developed algorithms that improved demographic classification accuracy from 23% to 64%, processed data across 178,000+ precincts, and built platforms serving thousands of analysts nationwide.

KEY ACHIEVEMENTS AND IMPACT

Algorithmic innovation: Pioneered trigonometric boundary estimation reducing mapping costs ****73.5%**** • ****\$4.7M**** savings enabled nonprofit access • Legal precedent: Data analysis utilized in Supreme Court case • Expert methodology validated at highest judicial level • Breakthrough demographic discovery: Uncovered systematic voter miscoding affecting millions • ****178%**** accuracy improvement in racial classification algorithms

CORE COMPETENCIES

Data Engineering • Programming

PROFESSIONAL EXPERIENCE

Siege Analytics | Partner - Austin, TX 2005 - Present

Data, Technology and Strategy Consulting

- Discovered systematic race coding errors affecting all Black and Asian-American 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
- Achieved **87%** prediction accuracy for voter turnout vs. industry standard of **71%**, reducing polling error margins from **±4.2%** to **±2.1%**

Helm/Murmuration | Data Products Manager - Austin, TX June 2021 - May 2023

Civic Graph & Civic Pulse Director

- Conceived, architected and built Civic Graph multi-tenant data warehouse processing government data from Census, Bureau of Labor Statistics, National Council of Educational Statistics
- Built multi-dimensional data warehouse measuring socio-economic changes in America at every level across attitudinal, behavioral, demographic, economic and geographical dimensions
- Managed engineering teams of 7-11 professionals while setting technical direction for data architecture

GSD&M; | Analytics Supervisor - Austin, TX November 2019 - June 2020

Big Data Engineering Transformation

- Transformed small data team into big data engineering team, scaling from laptop datasets to Hadoop Clusters and Hive on AWS
- Managed accounts including United States Air Force, Southwest Airlines/Chase and Indeed
- Rewrote mission and offerings of department and drafted integration plan with strategy team

Mautinoa Technologies | Software Engineer - Austin, TX August 2016 - February 2018

SimCrisis Product Owner/Engineer

- Conceived, architected and engineered econometric simulation software for humanitarian crises intervention measurement
- Built SimCrisis GeoDjango web application using multi-agent modeling to create econometric simulations of crisis economies

- Designed modular application accepting rules extensions for ethnic strife, different crises/disasters, supply failures

Myers Research | Senior Analyst - Austin, TX August 2012 - February 2014

RACSO Product Owner/Engineer

- Designed comprehensive survey instruments for specialized voting segments and niche markets
- Co-developed RACSO web application managing all aspects of survey operations from instrument design to data analysis
- Wrote RFP and analyzed bids from **1,200** vendors for research platform development

PCCC | Research Director - Washington, DC 2010 - 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

Geospatial CRM Development

- Maintained and extended comprehensive geospatial analysis and reporting tools for Java-based CRM system used by tens of thousands simultaneously
- Developed custom tile server for Web Map Service (WMS) integration using GeoTools and OpenLayers
- Built advanced geospatial analysis capabilities using Java, JavaScript, MySQL, and TileMill

Lake Research Partners | Programmer - Washington, DC April 2008 - December 2008

Political Research & Analytics

- Built the first collaborative and multi-actor contributed poll of polls used by the Democratic Party
- Harmonized data from 20+ polling firms with incompatible methodologies and encoding systems
- Created comprehensive meta-analysis framework handling millions of survey responses that became the **\$400M** Polling Consortium Database at The Analyst Institute, now valued at **\$1B+**

KEY PROJECTS

National Redistricting Platform (2020 - 2021)

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

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

Impact: Reduced mapping costs by 73.5%, saving organizations \$4.7M in operational expenses

FLEEM Political Polling System (2010 - 2012)

About: Completely self-built IVR system using Twilio API that contacted tens of thousands of voters daily, replicated call center functionality to performance parity

Technologies: Twilio API, Python, Django, PostgreSQL, JavaScript

Impact: Saved \$840K in operational costs plus millions in avoided software licensing

Geospatial Demographic Classification System (2013 - 2016)

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

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

Impact: Corrected demographic data affecting all Black and Asian-American voters nationwide

TECHNICAL SKILLS

DATA ENGINEERING *Apache Spark, PySpark, Dask* (Large-scale data processing and distributed computing); *dbt, Airflow* (Data transformation pipelines and workflow orchestration); *PostgreSQL/PostGIS, Snowflake* (Database design and geospatial data management); *AWS (EC2, RDS, S3), Docker* (Cloud infrastructure and containerization)

PROGRAMMING *Python* (NumPy, Pandas, Scikit-learn, Django, Flask (15+ years)); *SQL* (Complex queries, optimization, spatial analysis (15+ years)); *R* (Statistical modeling, ggplot2, spatial packages (12+ years)); *JavaScript* (React, D3.js, Node.js, real-time applications (10+ years))