

## PROFESSIONAL SUMMARY

Software engineer with 15+ years building systems that matter. Discovered systematic demographic coding errors affecting all Black and Asian-American voters, developed geospatial ML algorithms improving classification accuracy from 23% to 64%. Expert in translating complex analytical requirements into scalable technical solutions.

## KEY ACHIEVEMENTS AND IMPACT

Algorithmic innovation: Pioneered trigonometric boundary estimation reducing mapping costs 73.5% • \$4.7M savings enabled nonprofit access • Platform impact: Built redistricting system serving 12,847 analysts across 89 organizations • Real-time collaboration at national scale

## CORE COMPETENCIES

Programming and Development • Cloud & DevOps • Data Infrastructure

## PROFESSIONAL EXPERIENCE

### Siege Analytics | Partner - Austin, TX 2005 - Present

#### Data Science & Political Analytics

- 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
- Utilized advanced sampling methods to decrease survey margin of error from  $\pm 4.2\%$  to  $\pm 2.1\%$ , 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

### 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

## The Praxis Project | Interim Technology Manager - Washington, DC April 2009 - October 2009

### Public Health Technology

- Managed technology infrastructure for public health advocacy organization
- Developed database systems for tracking policy initiatives and outcomes
- Implemented CRM systems for stakeholder engagement and outreach

## 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

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

### Democratic Electoral Technology

- Led design and implementation of enterprise-scale multi-tenant data warehouse for geo-referenced demographic, econometric, and electoral data
- Managed engineering team of 11 professionals while setting technical direction for data architecture
- Modernized legacy ETL processes by implementing dbt and PySpark workflows, reducing processing time by 57%

## 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.

### FLEEM Political Polling System

**About:** Web application using Twilio API for regulated political surveys, handling tens of thousands of simultaneous calls with predictive dialer functionality

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

**Impact:** Saved PAC \$840,000 annually in polling costs while significantly improving data collection efficiency

### 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

**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)

**CLOUD & DEVOPS** *AWS* (EC2, RDS, S3, Lambda, CloudFormation, Auto Scaling, Load Balancing); *Containerization* (Docker, Kubernetes, container orchestration, microservices); *Monitoring* (CloudWatch, Prometheus, Grafana, application performance monitoring); *CI/CD* (Jenkins, GitHub Actions, automated testing, deployment pipelines)

**DATA INFRASTRUCTURE** *Processing* (Apache Spark, PySpark, Dask, parallel computing, distributed systems); *Pipelines* (Airflow, dbt, ETL design, data quality monitoring, automated testing); *Storage* (Data warehousing, data lakes, columnar storage (Parquet), data modeling); *Streaming* (Kafka, Redis, real-time processing, event-driven architecture)