Will Maberry

in will-maberry | 🌐 willmaberry.com

RESEARCH INTERESTS

I work in **computational epidemiology**, developing methods for **spatiotemporal infectious disease forecasting**, **rare-event detection**, and **biosurveillance early-warning systems**. My interests include climate–disease interactions, zoonotic and high-consequence pathogens, and interpretable ML models that support real-world public health decision-making.

EDUCATION

The University of Texas at Arlington (UTA)   Aug. 2022 – May 2026
B.S. in Computer Science   —   Fundamentals of AI Certificate   *GPA: 3.8 (6× Honor Roll)*

RESEARCH EXPERIENCE

USDA ARS — Research Assistant (part-time)   Jul. 2025 – Present
U.S. Department of Agriculture, Agricultural Research Service

- **Developing a national HPAI early-warning system**, producing forward-looking county-level outbreak forecasts one month ahead using multi-model ensembles, weighted blending, and threshold optimization (Optuna).

- Engineering leakage-safe forecasting infrastructure: rolling monthly retraining, **dual-window ensemble architectures**, and strict forward-only ingestion of agricultural, climate, ecological, and migratory-bird data.

- Designing spatiotemporal modeling components capable of true **future covariate dependence**, including synthetic next-month feature generation using ridge-based interpolation to simulate environmental trajectories.

- Addressing extreme rare-event imbalance (**0.9% positives**) through prevalence-aware ensembling, calibrated decision thresholds, and cost-sensitive learning strategies.

- Building operational decision-support tooling, including an interactive dashboard, along with **diagnostic analyses** (calibration curves, ternary confusion matrices, PCA/K-means clustering, prevalence-bias assessment).

USDA ARS — Research Assistant (internship)   May 2025 – Jul. 2025

- Built geospatial ML pipelines classifying **county-month HPAI presence** across the U.S., integrating climate variables, agricultural density, and migratory bird patterns.

- Developed imbalanced-learning (SMOTE) and gradient-boosting ensembles, achieving **80%+ balanced accuracy** on 2022–2024 national surveillance data.

- Performed **temporal robustness tests** via controlled pseudo-forecasting using ground-truth future covariates, demonstrating classifier sensitivity to temporal drift.

- Presented model outputs and diagnostics to USDA scientists and national program leaders, informing **operational surveillance and early-detection strategy**.

TECHNICAL SKILLS

Forecasting & Modeling	Spatiotemporal forecasting; ensemble methods; rare-event modeling
Machine Learning	TensorFlow; PyTorch; Scikit-learn; Imbalanced-learn; Optuna
Geospatial Analysis	GeoPandas; Google Earth Engine; Folium/Leaflet; raster/vector processing
Programming & Data	Python; C; Java; SQL; Bash; Pandas; NumPy
Pipelines & Deployment	FastAPI; Flask; Docker; automated retraining pipelines
Visualization	Matplotlib; interactive dashboards; risk/forecast mapping

OTHER EXPERIENCE

OpenAI Engagement Manager (Jul. 2024 – Present): Lead strategy for 800k+ users; increased engagement 120%.
UTA Operating Systems TA (Jan. 2025 – May 2025): Mentored 120 students; hosted weekly office hours.

SELECTED PROJECTS

ASL Translator — Real-time American Sign Language recognition; 2,000+ samples; 90%+ inference accuracy.
Algorithm Learning Platform — Visualization tool adopted by UTA faculty; 50+ students/semester.