

Technical Datasheet: SARAHAI – Situational Awareness Response And Help AI

Empowering SLED, Utility, and Regulated Telecom Markets with Cost-Saving AI Solutions



OVERVIEW

SARAHAI (Situational Awareness Response and Help AI) is an AI-driven platform designed to streamline operations, enhance safety, and reduce costs. Tailored for **State, Local, and Education (SLED)** markets, **Utilities**, and **Regulated Telecoms**, SARAHAI leverages cutting-edge geospatial analysis, object detection, and monitoring to optimize resource usage and improve decision-making—all while saving taxpayer, ratepayer, and customer dollars.

KEY FEATURES

1) Geospatial Intelligence (GIS)

- **Dynamic GIS Transformations:** Supports advanced geospatial analytics, terrain integration, and CRS transformations via pyproj, with real-world CRS support for polar, urban, and high-altitude environments.
- **Edge-Case GIS Solutions:** Handles complex scenarios such as wildfire zones, storm-impacted areas, or urban clutter.
- **Real-Time Proximity Analysis:** Integrated PostGIS for spatial operations like bounding-box and proximity queries.

2) YOLO-Powered Detection

- **Real-Time Object Recognition:** Advanced YOLO (You Only Look Once) models for identifying critical infrastructure damage, network disruptions, or potential threats.
- **Caching and Resource Efficiency:** Includes metrics to monitor caching effectiveness, reducing redundant processing and optimizing resource usage.
- **Incremental Scaling:** Automatically adjusts resolution and batch size based on workload and hardware performance.

3) PostGIS Database Integration

- **Spatial Queries for Resource Optimization:** Supports complex spatial operations such as ST_Within and ST_Distance to improve response efficiency.
- **Automated Data Retention:** Confidence-based policies ensure high-value records are retained while minimizing storage costs.
- **Proximity-Based Alerts:** Enables targeted alerts and optimized resource deployment in emergencies.

4) Monitoring and Alerts

- **Comprehensive Resource Monitoring:** Tracks CPU, GPU, memory usage, and generates alerts for threshold breaches.
- **Advanced GPU Metrics:** Collects power consumption, fan speed, and thermal data via pynvml or fallback nvidia-smi.
- **Real-Time Notifications:** Integrates with Slack, email, or PagerDuty for immediate issue escalation.

5) Stress-Tested Pipelines

- **Concurrency Simulation:** Validates reliability under high workloads, simulating concurrent GIS queries, YOLO inferences, and database operations.
- **End-to-End Workflow Testing:** Ensures seamless integration from GIS transformations to object detection and database archival.

SLED MARKET SOLUTIONS

1) Safety and Security

- **School District Protection:** Real-time detection of unauthorized personnel, weapons, or suspicious activities using YOLO models.
- **Traffic and Crowd Monitoring:** GIS-powered optimization of traffic flows, congestion management, and crowd control in public spaces.

2) Smart Infrastructure

- **Predictive Maintenance:** Monitors public assets such as bridges, roads, and parks, enabling proactive repairs to prevent failures.
- **Emergency Management:** Optimized dispatch of first responders using PostGIS proximity queries.

3) Operational Savings

- **Data-Driven Storage:** Automates archival of low-priority data to reduce storage costs.
- **Dynamic Resource Scaling:** Optimizes existing hardware, lowering operational expenses.

UTILITY MARKET SOLUTIONS



1) Grid Resilience and Optimization

- **Outage Detection:** Real-time identification of fallen power lines, transformer malfunctions, or damaged infrastructure using YOLO object detection.
- **Asset Mapping:** GIS-powered mapping of electrical grids and water pipelines to pinpoint vulnerabilities.

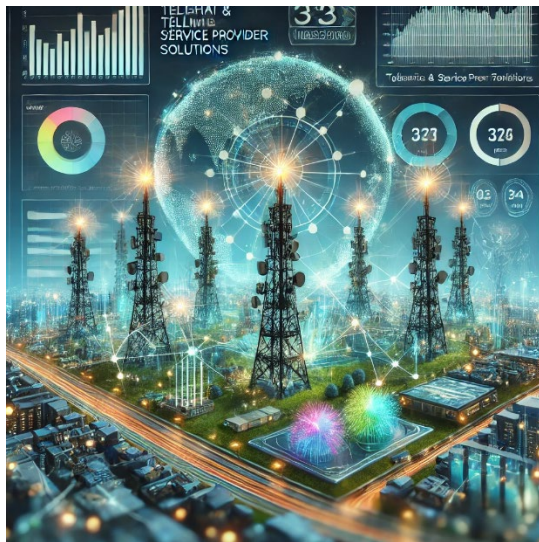
2) Wildfire Prevention

- **Early Detection:** Identifies sparks or hotspots using YOLO models integrated with drones or cameras.
- **Efficient Deployment:** PostGIS-enabled queries optimize the allocation of firefighting resources.

3) Ratepayer Benefits

- **Energy Loss Reduction:** Identifies inefficiencies in the grid, reducing energy waste and lowering customer bills.
- **Proactive Maintenance:** Predictive analytics identify failing components, avoiding costly outages.

TELECOM & SERVICE PROVIDER SOLUTIONS



1) Network Resilience

- **Disruption Detection:** YOLO models identify damaged infrastructure (e.g., cell towers, fiber lines) after storms or vandalism.
- **Fiber and Tower Mapping:** GIS integration enables dynamic mapping of telecom assets, identifying potential points of failure.

2) Disaster Recovery

- **Storm Response:** GIS-powered insights combined with PostGIS proximity queries optimize resource allocation during disaster recovery.
- **Proximity-Based Maintenance:** Enables quick deployment of field teams to critical areas, reducing downtime.

3) Cost-Saving Benefits

- **Efficient Service Restorations:** Automated GIS queries pinpoint areas requiring service restoration, improving customer satisfaction and reducing penalties for SLA breaches.
- **Bandwidth Optimization:** Identifies network congestion points, enabling strategic upgrades and load balancing.

VALUE PROPOSITION

Savings for Taxpayers, Ratepayers, and Customers

- **Operational Cost Reductions:** Optimized workflows and automated processes reduce operational expenses across sectors.
- **Infrastructure Longevity:** Proactive maintenance and monitoring extend asset lifecycles, reducing long-term costs.
- **Minimized Downtime:** Faster response times and real-time insights lower the financial and operational impact of service interruptions.

Scalability and Sustainability

- **Modular Design:** Grows with organizational needs, ensuring long-term adaptability and ROI.
- **Data-Driven Decision Making:** Enables more effective investments in infrastructure, safety, and resource allocation.

TECHNOLOGY SNAPSHOT

Feature	Benefit
Advanced GIS Transformations	Precision mapping for planning and incident response.
YOLO Inference Engine	Real-time object detection for safety and efficiency.
PostGIS Database Integration	Optimized spatial queries for resource allocation.
Proactive Monitoring	Alerts for hardware/resource thresholds ensure reliability.
Stress-Tested Pipelines	Validated for high-concurrency scenarios across all sectors.

GET STARTED

Discover how SARAHAI can optimize your operations and save costs for taxpayers, ratepayers, and customers.

Visit www.sarahai.net or email for more details at information@tensornetworks.net