OAK UrbanSense

Ambient Urban Intelligence — every city a sensor grid, no new hardware

IDEaS CFP 006 · Challenge 15
Turning Urban Data into Real-Time Insight through AI
Component 1b · TRL 4 · W7714-248676/015

An AI middleware layer over a city's **existing** cameras, acoustic arrays, air-quality monitors, vibration sensors and passive-RF points: a machine-readable **privacy gate enforced at ingestion** feeds a pattern-of-life anomaly engine that fuses indications **across feed types** into explainable, conformally-calibrated alerts on a city COP — in real time, at a fraction of dedicated-sensor cost.

5 / 5
threat events detected — all by ≥2 independent feed types

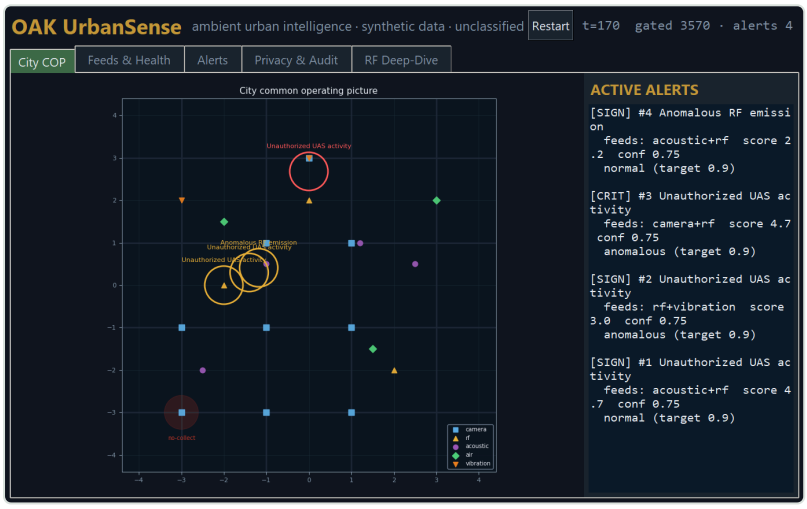
2 vs 249
false alerts vs weak indications auto-suppressed

0.902
conformal coverage (target 0.90, guaranteed)

~16,000/s
records/second per core · ~63 µs/record

0
raw identifiers retained (8,610 records gated)

TRL 4 → 6
lab-validated → pilot-proven, privacy-assessed



Capability at a glance

- Five heterogeneous city feeds — cameras, passive RF, acoustic, air quality, vibration — through one source-agnostic HAL; feeds can degrade or drop and detection carries on (measured).
- Privacy compliance enforced AT INGESTION by machine-readable policy: aggregate features only, identifiers stripped by construction, no-collect geofences, retention limits, hash-chained tamper-evident audit.
- Per-sensor pattern-of-life baselines; anomalies fused across feed types by the same multi-INT correlation OAK fields in its EW SUITE.
- Explainable, machine-readable JSON alerts: contributing sensors, per-feature evidence, plain-language rationale, conformal (coverage-guaranteed) confidence.
- Urban counter-UAS demonstrated end-to-end: camera + 5.8 GHz downlink + rotor acoustics fuse to one alert; ELINT PDW deep-dive separates 3/3 urban emitters.
- Pure software, numpy-only, no GPU, no new hardware; ships its own synthetic-city generator — no government data required.

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