



شركة ابتكارات حادة
Sharp Innovations
Innovating The Tech Experience

GARBAGE DETECTION SYSTEM

OVERVIEW

The AI Smart City Garbage Detection System by Sharp Innvotech is a centralized, AI-powered waste management platform. It integrates advanced computer vision with existing municipal CCTV networks to monitor public spaces, such as streets, parks, and highways. The system continuously scans for waste accumulation, illegal dumping, and bin overflows, transforming passive video feeds into proactive, digital cleanup tasks.

CHALLENGES

- 1. Reactive Operations:** Reliance on scheduled collections or manual citizen complaints leaves waste unaddressed for extended periods, creating public health and hygiene risks.
- 2. Operational Blind Spots:** Manual monitoring cannot cover all urban areas 24/7, leading to undetected litter hotspots and illegal dumping.
- 3. Inefficient Logistics:** Fixed-route sanitation schedules often result in garbage trucks servicing empty bins, which wastes fuel, labor, and time.
- 4. Data & Accountability Gaps:** A lack of digitized records makes it difficult for municipalities to track performance, verify cleanup completion, or optimize future route planning.



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ANALYSIS

- 1.** Centralized Hygiene Intelligence: Transitions urban sanitation from a reactive, complaint-based model to a unified digital ecosystem, establishing a "single source of truth" for waste data.
- 2.** Proactive Urban Sanitation: Uses deep neural networks to identify and categorize waste types and volumes in real time, allowing dispatchers to prioritize high-severity hotspots.
- 3.** Scalable Operational Oversight: Engineered to integrate with thousands of existing cameras, enabling smart city-wide monitoring without requiring massive hardware replacements.
- 4.** Data-Driven Accountability: Replaces subjective reporting with timestamped visual evidence, facilitating verifiable performance audits and supporting long-term urban sustainability goals.

SOLUTIONS



- 1.** Automated Litter Sensing: Employs computer vision to detect scattered trash and dumpster overflows, triggering alerts the moment thresholds are met.
- 2.** GPS Hotspot Mapping: Geotags every waste incident with precise coordinates, directing cleanup crews exactly to the problem area.
- 3.** Illegal Dumping Detection: Specifically configured to identify unauthorized disposal of large debris, such as construction waste or discarded furniture.
- 4.** Sanitation Dispatch Integration: Connects directly with municipal dispatch software to push active cleanup tickets to the nearest available sweeper or truck.
- 5.** Environmental Reliability: Advanced algorithms ensure high detection accuracy even in challenging conditions, such as nighttime, high heat, or dusty environments.



KEY FEATURES



Pristine Public Spaces

Consistent monitoring ensures streets, parks, and squares maintain high standards of public hygiene and visual appeal.



Rapid Cleanup Response

Instant alerts allow sanitation crews to remove waste before it spreads, decays, or attracts pests.



Reduced Fleet Operating Costs

Optimizes garbage truck routes by targeting only necessary pickups, significantly lowering fuel and labor expenditures.



Public Health Protection

Eliminates organic waste pileups quickly, preventing the breeding of disease-carrying vectors.



Elevated Citizen Satisfaction

A visibly cleaner city strengthens public trust in municipal operations and improves the overall quality of life for residents.

END RESULT

- **Eliminated Litter Hotspots:** A significant reduction in chronic waste areas through automated detection and targeted intervention.
- **Optimized Sanitation Routes:** A data-driven approach to municipal logistics that ensures resources are deployed where they are needed most.
- **Resilient Smart City Framework:** A future-ready hygiene infrastructure that supports the sustainability and efficiency objectives of Saudi Vision 2030.
- **Proven Sustainability:** Measurable improvements in urban cleanliness and a lower carbon footprint through optimized fleet operations.



TECHNOLOGY



Angular



Nodejs



Postgres



Express



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