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AI-Powered Smart Restroom System

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Abstract: *Public toilet maintenance is a critical challenge due to hygiene concerns, high operational costs, and the need for frequent manual intervention. This paper proposes an IoT-based self-sustained autonomous system for public toilet management, integrating smart sensors, automated cleaning mechanisms, and AI-driven analytics to ensure cleanliness, odor control, and efficient resource utilization. The system employs real-time monitoring of usage, air quality, and supply levels using IoT-enabled sensors, while automated flushing, disinfection, and deodorization maintain hygiene standards. Predictive maintenance powered by AI helps preempt faults, reducing downtime and maintenance costs. The system operates on renewable energy sources, ensuring sustainability and cost-effectiveness. Cloud-based data analytics provide insights for optimized cleaning schedules and resource management. This solution enhances public hygiene, minimizes manual effort, and promotes efficient, eco-friendly sanitation management. and ensuring a consistently clean environment, this smart sanitation solution aims to revolutionize public toilet management, promoting better hygiene.*

Keywords: Artificial Intelligence, Internet of Things

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