Submission Summary

Conference Name
Symposium on Smart, Sustainable, and Secure Internet of Things

Paper ID
28

Paper Title
IntelliGuard: IoT-Enabled Autonomous Spybot Intelligence for Real-Time Surveillance in Next-Generation Security Applications

Abstract
The rapid advancements in ubiquitous computing have made surveillance robots vital in military and security systems. IoT and sensor miniaturization enable new autonomous monitoring capabilities where traditional fixed installations or human operators prove ineffective. IntelliGuard, an ESP-32-based IoT surveil-lance robot, integrates camera streaming, motor-driven navigation, and central-ized processing for military applications. The system provides autonomous mo-bility, real-time surveillance, and secure data transmission while remaining cost-effective. Radar and ultrasonic sensors enable precise obstacle detection within three meters. Field testing revealed performance variations under different envi-ronmental conditions, with optimal functionality in low-interference settings. Response latency remains minimal while IoT connectivity enables remote oper-ation. Performance directly correlates with sensor precision and connection quality. Future developments will focus on more accurate sensors, stronger communication protocols, improved navigation for irregular obstacles, and en-hanced filtering algorithms to minimize interference effects. This study estab-lishes a foundation for advanced IoT-connected robotic surveillance systems in military applications.

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Primary Subject Area
IoT Security, Privacy, & Trust

Submission Files
Intelli Guard Spybot - Final.pdf (532.7 Kb, 4/2/2025, 12:42:24 PM)