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Night Vision Security Patrolling Robot with Sound Sensing

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Abstract: *This project presents a Raspberry Pi-based automated system designed to integrate night vision and audio sensing capabilities for versatile applications such as surveillance and robotics. The system employs a night vision camera for visual data acquisition and a microphone for sound sensing, enabling real-time monitoring and intelligent responses to environmental stimuli. The Raspberry Pi serves as the central processing unit, seamlessly interfacing with the camera, microphone, and motor driver. The motor driver controls DC motors with specifications of 12V and 30 RPM, facilitating precise mechanical movements required for system operation. Powered by an efficient power supply, the system ensures consistent functionality even in resource-constrained environments. The modular design allows adaptability for a wide range of applications, including home security, autonomous robotics, and remote surveillance in low-light conditions. With the integration of a motor driver, the system enables automated movements, making it suitable for mobile applications such as patrolling robots or automated guided vehicles (AGVs). This project emphasizes the practicality and scalability of utilizing Raspberry Pi for cost-effective and efficient solutions in fields requiring simultaneous video and audio processing. Future enhancements could include adding artificial intelligence (AI) for object and sound recognition, wireless connectivity for remote monitoring, and advanced motor controls for more complex operations. The proposed system is a promising step toward accessible and adaptable technologies that combine vision, sound, and mobility in a compact and easy-to-deploy platform. This work contributes to the growing field of IoT-enabled smart systems and robotics by demonstrating an efficient multi-functional solution.*

Keywords: Camera, DC motar, Rasberry Pi, AI

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