Motion-Activated Smart Security Camera — Built with Raspberry Pi, ESP-01, Flask & Cloudflare Tunnel

I recently built a complete DIY motion-triggered surveillance system using a Raspberry Pi and ESP-01. The system detects motion, captures footage, and provides full remote control through a Flask-based web interface—secured using Cloudflare Tunnel. Every event is logged in real time via Discord webhooks.

Key Features:

- Motion detection using PiCamera2 and GPIO
- Flask web dashboard for remote monitoring and control (pause/resume, light toggle, doorbell)
- Automatic upload of captured videos/images to AWS S3
- ESP-01 handles light control and remote doorbell trigger via relays
- Timed light switching functionality with safety logic
- Secure remote access using Cloudflare Tunnel
- Real-time logging and alerts via Discord Webhooks

Tech Stack:

- Raspberry Pi with PiCamera2
- ESP-01 (programmed via Arduino IDE)
- Python (Flask, OpenCV, picamera2, boto3)
- AWS S3 for media storage
- Cloudflare Tunnel for secure HTTPS access
- Discord Webhooks for real-time alerts

Project Source Code & Documentation:
GitHub: github.com/VaradRane12/Motion-Activated-Security-Camera

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This project was a hands-on dive into embedded systems, real-time automation, cloud integration, and remote access security. If you're working on anything similar or interested in IoT and surveillance tech, would love to hear your thoughts or suggestions.

#IoT #RaspberryPi #ESP01 #Flask #Cloudflare #AWS #Python #HomeAutomation #OpenCV #VaradRaneProjects