

ECOTRAP: PROTECTING WILDLIFE – SMART TRAPS FOR A GREENER TOMORROW

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EcoTrap integrates a network of smart sensors, image processing algorithms, and automated trapping mechanisms to detect, classify, and securely capture animals for safe relocation or research purposes. The system employs deep learning-based species identification, ensuring that only targeted animals are captured while reducing false positives. High-resolution infrared cameras improve detection accuracy in low-light conditions. The motion and ultrasonic sensors work in tandem with a Raspberry Pi processing unit, enabling precise animal tracking and identification. The system further incorporates GPS and GSM modules, allowing real-time location tracking and instant alerts to wildlife authorities. A cloud-based dashboard provides continuous monitoring, facilitating efficient decision-making for conservationists. By leveraging solar-powered batteries, EcoTrap ensures sustainability and long-term deployment in remote environments. Experimental results demonstrate that EcoTrap significantly reduces unintended captures, with the YOLOv8-based classification model achieving over 90% accuracy in distinguishing between species. The system minimizes false triggers and optimizes wildlife rescue operations, making it a viable solution for sustainable conservation efforts. Future enhancements will focus on expanding the species database, optimizing energy efficiency, and integrating blockchain technology for secure data logging and traceability.