

ABSTRACT

Animal interference on power distribution networks in forested areas often causes outages and infrastructure damage. This study aims to design an automated detection and repellent system to address this issue, with its scope limited to detecting birds and squirrels in the Dewata Forest area, Majalaya.

The designed system uses an MLX90640 thermal camera to capture heat images, which are processed by a Raspberry Pi 5. The You Only Look Once (YOLO) algorithm is employed for specific object identification, and if a bird or squirrel is detected, an LED strobe actuator is activated to deter the animal.

Test results show the YOLO model achieved an mAP50-95 score of 88.5% (89.9% for birds; 71.2% for squirrels) and was effective at detecting objects up to 35 cm. The system proved to be operationally stable during field tests. Thus, this research successfully designed a functional system with the potential to enhance power grid reliability by minimizing animal-related disturbances.

Keywords: *Animal Detection, Electrical Distribution Network, LED Strobe, Raspberry Pi, Thermal Camera, YOLO.*