

***Internet of Things (IoT) Based Buzzer Frequency Control System for an Insect
Killer Device to Control Rats and Birds in Rice Crops***

Supervised by: Ahmad Rofi'i, S.Pd., M.Pd.

Muhammad Afif Firmansyah

Mechatronics Engineering Technology

Engineering Department

ABSTRACT

This study aimed to design and evaluate an Internet of Things (IoT) based insect killer control system powered by solar energy for rice pest management. The system consist of a 50 WP solar panel, a 12 volt 30 Ah LiFePO₄ battery, an Arduino Uno, an ESP32 module, an ultraviolet lamp, a high-voltage electrical grid, and 1 kHz and 20 kHz buzzers. A Research and Development (R&D) approach using a prototyping model was employed. Test results indicate that the solar panel generated an average voltage of 12,99 volt, a current of 0,34 A, and a power output of 4,41 W, while the battery maintained an average voltage of 12,91 volt and a charging current of 0,32 A. The 1 kHz and 20 kHz buzzers successfully repelled rats six times and birds twice, whereas the ultraviolet lamp operated stably for 12 hours and effectively attracted insects toward the high-voltage wires. The system operates automatically and allows for IoT based monitoring, offering potential as an environmentally friendly alternative for pest control.

Keywords: *Internet of Things (IoT), insect killer, solar panel, LiFePo₄ battery, ultraviolet lamp.*