

ABSTRAK

Penelitian ini bertujuan merancang dan membangun prototipe drone quadcopter tipe whoop berbasis mikrokontroler ESP32 yang dapat dikendalikan melalui smartphone menggunakan aplikasi RemoteXY. Sistem ini dirancang sebagai media pembelajaran teknologi kendali nirkabel, sistem tertanam (embedded system), dan implementasi Internet of Things (IoT) pada perangkat terbang skala kecil.

Metode penelitian dilakukan melalui tahap perancangan perangkat keras, perancangan perangkat lunak, pembuatan rangka drone, perancangan PCB, perakitan komponen, serta pengujian sistem. Komponen utama yang digunakan meliputi ESP32, motor DC coreless, driver motor MOSFET, baterai Li-Po, dan modul komunikasi Bluetooth/ Wi-Fi bawaan ESP32

Hasil penelitian menunjukkan bahwa prototipe drone dapat dikendalikan melalui smartphone dengan fungsi dasar seperti throttle, arah gerak, dan kestabilan kontrol.

Penggunaan ESP32 memberikan keunggulan pada konektivitas nirkabel, ukuran ringkas, serta fleksibilitas pengembangan sistem di masa mendatang.

Dengan demikian, penelitian ini diharapkan dapat menjadi referensi pengembangan drone skala kecil berbasis mikrokontroler untuk kebutuhan pendidikan, penelitian, maupun inovasi teknologi.

Kata Kunci: Drone, Quadcopter, ESP32, RemoteXY, IoT, Prototype

ABSTRACT

This research aims to design and develop a whoop-type quadcopter drone prototype based on the ESP32 microcontroller, which can be controlled through a smartphone using the RemoteXY application. The system is designed as a learning medium for wireless control technology, embedded systems, and the implementation of the Internet of Things (IoT) in small-scale flying devices.

The research method was carried out through hardware design, software development, drone frame fabrication, PCB design, component assembly, and system testing. The main components used include ESP32, coreless DC motors, MOSFET motor drivers, Li-Po battery, and built-in Bluetooth/Wi-Fi communication modules of the ESP32. The results show that the drone prototype can be controlled via smartphone with basic functions such as throttle, movement direction, and control stability. The use of ESP32 provides advantages in wireless connectivity, compact size, and flexibility for future system development

Therefore, this research is expected to become a reference for the development of small-scale microcontroller-based drones for educational purposes, research, and technological innovation

Keywords: Drone, Quadcopter ESP32, RemoteXY, IoT, Prototype.