IMPLEMENTATION OF ENEMY IDENTIFICATION SYSTEM USING IMAGE PROCESSING TECHNOLOGY AUTOMATIC SECURITY ROBOT

Abstract

The Industrial Revolution brought significant advances in military technology, one of which was the development of a robotic system to improve security. Indonesia, particularly Papua, still faces armed threats. This study designed and implemented an image processing-based SS7 shield guard robot prototype to distinguish between friend and foe. The system uses a camera as a visual sensor, Raspberry Pi as a transmission center, and wireless data transmission to the guard post in real time. Tests were conducted at varying distances (2-16 meters), viewing angles (0°–90°), and light intensity (0-maximum Lux). The best results were obtained at a distance of 2-12 meters, an angle of 0°-60°, and a minimum illumination of 169 lux, with stable detection accuracy across a wide range of objects. The system demonstrated optimal performance in bright conditions and decreased at 0 Lux illumination. These findings demonstrate that the integration of hardware and image processing algorithms can support improved security for military posts and serve as an initial step towards the development of more adaptive automated security systems in the future