ABSTRAK

Pencurian barang di minimarket merupakan permasalahan yang sering terjadi dan menimbulkan kerugian signifikan bagi pemilik maupun pegawai. Sistem CCTV konvensional hanya merekam kejadian tanpa kemampuan mengenali aksi mencurigakan secara otomatis. Penelitian ini bertujuan merancang sistem deteksi pencurian berbasis visi komputer menggunakan algoritma *YOLOv*8 dan *DETR*. Metodologi yang digunakan meliputi studi literatur, pengumpulan dan anotasi dataset, pelatihan model deteksi, integrasi sistem dengan Arduino Uno dan buzzer, serta bot Telegram dan MySQL. Proses kerja sistem diawali dengan pengambilan citra atau video melalui kamera, dilanjutkan dengan deteksi objek dan analisis perilaku pelanggan. Deteksi dilakukan berdasarkan parameter pencurian, meliputi gerakan tangan mengambil barang dari rak, menyembunyikan barang ke saku, tas, atau pakaian, perubahan posisi tubuh untuk menutupi barang. Pola tersebut dianalisis melalui posisi tangan, pergerakan tubuh, dan interaksi terhadap rak barang. Hasil deteksi memicu penyimpanan data ke database MySQL, pengiriman notifikasi berisi foto dan waktu kejadian melalui bot Telegram, serta pengaktifan buzzer oleh Arduino Uno sebagai alarm. Pengujian menunjukkan sistem mampu mendeteksi aksi pencurian dengan rata-rata akurasi 90,9% pada *YOLOv*8 dan 79,4% pada *DETR*, serta memberikan peringatan secara real-time. Sistem ini diharapkan dapat membantu meminimalkan kerugian dan meningkatkan keamanan minimarket.

Kata kunci: *YOLOv*8, *DETR*, deteksi pencurian, minimarket, visi komputer, Arduino, Telegram, MySQL.

ABSTRACT

Shoplifting in minimarkets is a common problem that causes significant losses for both owners and employees. Conventional CCTV systems only record incidents without the ability to automatically recognize suspicious actions. This study aims to design a theft detection system based on computer vision using the YOLOv8 and DETR algorithms. The methodology includes literature review, dataset collection and annotation, model training, and system integration with Arduino Uno and a buzzer, as well as a Telegram bot and MySQL. The system workflow begins with capturing images or videos through a camera, followed by object detection and customer behavior analysis. Detection is performed based on theft parameters, including hand movements to take items from shelves, concealing items in pockets, bags, or clothing, and changes in body position to hide items. These patterns are analyzed through hand positions, body movements, and interactions with store shelves. Detection results trigger data storage in a MySQL database, notification delivery containing the suspect's photo and incident time via a Telegram bot, and buzzer activation through an Arduino Uno as an alarm. Testing shows that the system can detect theft actions with an average accuracy of 90.9% using YOLOv8 and 79.4% using DETR, and providing real-time alerts. This system is expected to help minimize losses and improve minimarket security.

Keywords: YOLOv8, DETR, theft detection, minimarket, computer vision, Arduino, Telegram, MySQL.