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| Title | A Deep Learning Model for YOLOv9-based Human Abnormal Activity Detection: Violence and Non-Violence Classification | | |
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| Abstract |  |
| Abnormal activity detection is crucial for video surveillance and security systems, aiming to identify behaviors that deviate from normal patterns and may indicate threats or incidents such as theft, vandalism, accidents, and aggression. Timely  recognition of these activities enhances public safety across various environments,  including transportation hubs, public spaces, workplaces, and homes. In this study, we focus on detecting violent and non-violent activities of humans using a YOLOv9-based deep learning model considering the above issues. A diverse dataset has been built of 9,341 images from various platforms, and then the dataset has been pre-processed, i.e., augmentation, resizing, and annotating. After pre-processing, the proposed model has been trained which demonstrated strong performance, achieving an F1 score of 95% during training for 150 epochs. It was also trained for 200 epochs, but early stopping was applied at 148 epochs as there was no significant improvement in the results. Finally, the results of the YOLOv9-based model have been analyzed with other baseline models (YOLOv5, YOLOv7, YOLOv8, and YOLOv10) and it performed better compared with others. | |