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Efficient Object Detection with YOLO: A Comprehensive Guide

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Abstract: Object detection presents itself as a pivotal and complex challenge within the domain of computer vision. Over the past ten years, as deep learning techniques have advanced quickly, researchers have committed significant resources to utilising deep models as the basis to improve the performance of object identification systems and related tasks like segmentation, localization. Two-stage and single-stage detectors are the two basic categories into which object detectors can be roughly divided. Typically, two-stage detectors use complicated structures in conjunction with a selective region proposal technique to accomplish their goals. Conversely, single-stage detectors aim to detect objects across all spatial regions in one shot, employing relatively simpler architectures. Any object detector's inference time and detection accuracy are the main factors to consider while evaluating it. Single-stage detectors offer quicker inference times, but two-stage detectors frequently show better detection accuracy. But since the introduction of YOLO (You Only Look Once) and its architectural offspring, detectors. The adoption of YOLO in various applications is primarily driven by its faster inference times rather than its detection accuracy alone.

Keywords: YOLO, Object Detection, Keras, Open CV, CNN, R-CNN, Tensor Flow, YOLO V3, Yolo NAS

