# Real-Time Detection of Object Missing and New Object Placement

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Task: ML Engineer Intern Evaluation

## 1. Objective

To build a real-time video analytics pipeline that can detect:

• Missing Object Detection – when a previously present object disappears.

• New Object Placement Detection – when a new object appears.

## 2. Approach

We used the YOLOv5 object detection model along with DeepSORT for multi-object tracking. Object IDs are tracked frame-to-frame to identify missing and newly appeared objects. The system runs inside a Docker container for easy reproducibility and deployment.

## 3. Output

• Output video: output\_video.mp4

• Screenshots from key frames: stored in frames

## 4. FPS Achieved

• Average FPS: ~5.0

## 5. Hardware Used

• CPU: AMD Ryzen 5 5500U with Radeon Graphics

• RAM and ROM: 8GB, 512GB

• GPU: Integrated AMD Radeon™ Graphics Card

• OS: Windows 11 with Docker Desktop and WSL2

## 6. Optimizations

• Disabled cv2.imshow() for compatibility with Docker CLI

• Converted object IDs to integers to prevent type errors

• Added logging to track processed frames and output performance

## 7. Notes

This solution works in real-time on test videos and has been containerized for consistent results across machines. The detection model can be replaced or extended for task-specific use cases with minimal changes.