5. MULTIPLE OBJECT TRACKING USING OPENCV

EX.N0 : 5	**DESIGN AND IMPLEMENT MULTIPLE OBJECT TRACKING USING OPENCV**
DATE : 25/02/2025	

AIM:

To design and implement Multiple Object Tracking (MOT) using OpenCV to track multiple objects in a video stream in real-time.

ALGORITHM:

Step 1: Import Libraries: Import OpenCV and NumPy.

Step 2: Load Video: Capture video using cv2.VideoCapture.

Step 3: Select Objects: Manually select objects to track in the first frame using selectROI().

Step 4: Initialize Trackers: Create a separate tracker for each object and initialize them with the selected bounding boxes.

Step 5: Track Objects: Update each tracker in each frame to get the new position of the objects.

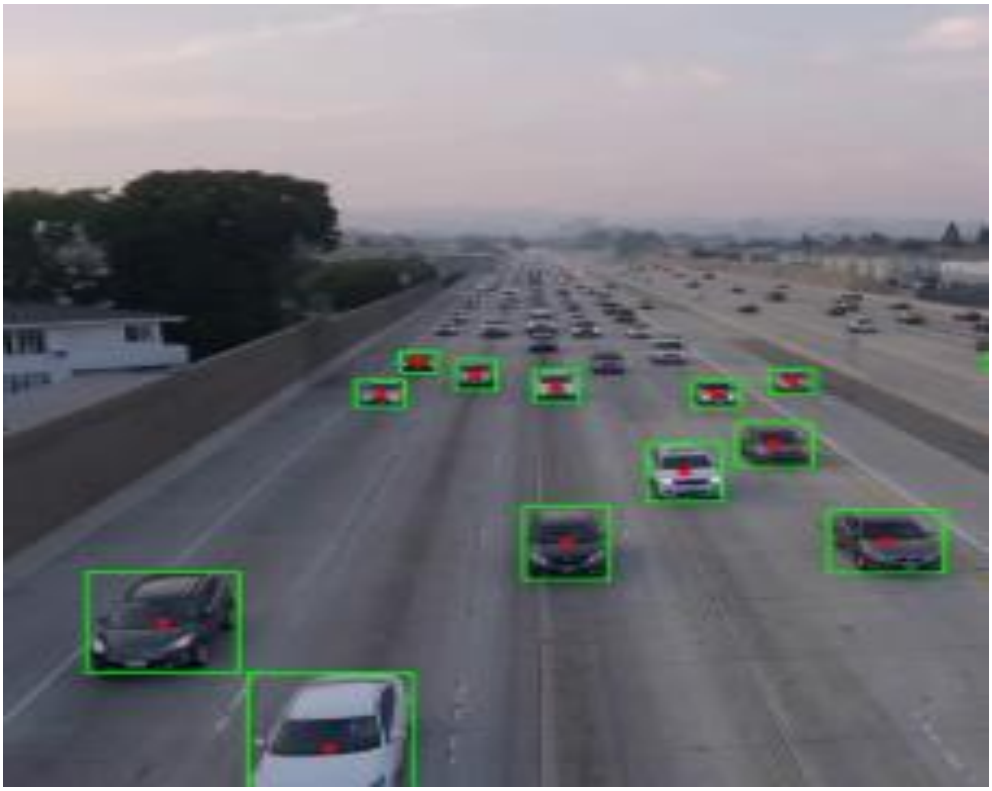
Step 6: Display and Exit: Draw bounding boxes around tracked objects and display the frame; exit on pressing q.

PROGRAM:

```
import cv2
import numpy as np
cap = cv2.VideoCapture('input_video.mp4')  # Replace with 0 for webcam or video file path
tracker_type = 'CSRT'  # Other options: 'KCF', 'MOSSE'
tracker = cv2.TrackerCSRT_create() if tracker_type == 'CSRT' else cv2.TrackerKCF_create()
ret, frame = cap.read()
if not ret:
```

```
print("Failed to read video")
cap.release()
exit()
trackers = []
while True:
bbox = cv2.selectROI("Select Object to Track", frame, fromCenter=False, showCrosshair=True)
trackers.append(cv2.TrackerCSRT_create())  # Create a new tracker for each object
trackers[-1].init(frame, bbox)  # Initialize tracker with the selected bounding box
cv2.destroyWindow("Select Object to Track")
cv2.imshow("Tracking", frame)
cv2.waitKey(1)
print("Press 'q' to start tracking after selecting all objects.")
if len(trackers) > 0:  # If at least one object is selected
key = cv2.waitKey(0)
if key == ord('q'):  # Press 'q' to continue
break
while cap.isOpened():
ret, frame = cap.read()
if not ret:
break
for tracker in trackers:
ret, bbox = tracker.update(frame)  # Get updated position of the object
if ret:
x, y, w, h = [int(v) for v in bbox]
cv2.rectangle(frame, (x, y), (x + w, y + h), (255, 0, 0), 2)  # Draw rectangle for the object
else:
cv2.putText(frame, "Tracking failed", (10, 30), cv2.FONT_HERSHEY_SIMPLEX, 1, (0, 0, 255),
2)
cv2.imshow("Multiple Object Tracking", frame)
if cv2.waitKey(1) & 0xFF == ord('q'):
break
cap.release()
cv2.destroyAllWindows()
```

OUTPUT:



RESULT:

Thus the Program has been executed successfully and verified.