

CSE541 - Computer Vision

Weekly Report 1

**Improvising Object Tracking Algorithm SORT for Long-Term Trajectory Extraction**

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### In the first week we tried to understand the SORT Algorithm. Based on our understanding, we created the following pointers:

### **Introduction:**

### The Simple Online and Realtime Tracking (SORT) algorithm is a widely used method in the field of computer vision for tracking objects in video streams. This document aims to provide an overview of the SORT algorithm and its significance in object tracking tasks.

### **Step 1: Understanding Object Detection:**

### Object detection is the process of identifying and locating objects within an image or video frame.

### **Step 2: Introduction to SORT Algorithm:**

### SORT is designed for real-time object tracking by combining object detection, motion prediction, and data association principles.

### **Step 3: Data Association:**

### Data association is crucial in SORT for linking object detections across consecutive frames, maintaining object identity.

### **Step 4: Motion Prediction:**

### SORT predicts object motion to estimate future positions, aiding in smoother tracking.

### **Step 5: Filtering and Smoothing:**

### Filtering and smoothing techniques like Kalman filtering reduce noise and uncertainty in object trajectories.

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### **Conclusion:**

### SORT offers a robust solution for real-time object tracking in computer vision applications, providing developers with effective tracking capabilities.

### **References:**

### 1. Bewley, Alex, et al. "Simple Online and Realtime Tracking with a Deep Association Metric." Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition Workshops. 2016.

### 2. OpenCV Documentation: https://docs.opencv.org/

### 3. TensorFlow Documentation: https://www.tensorflow.org/