Course Name: Machine Learning

Weekly Report: 1

Group Name: XYZ

Submitted to faculty:

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Date of Submission:

22 Feb 2025

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Work Done This Week

Literature Review

1. Unifying Short and Long-Term Tracking with Graph Hierarchies

A notable study relevant to our project is the paper titled "Unifying Short and Long-Term Tracking with Graph Hierarchies," which introduces the SUSHI (Strong and Unified Scalable Hierarchical multi-object tracker) framework. This research presents a combined method to tackle both short-term and long-term tracking challenges in Multi-Object Tracking (MOT).

Overview of SUSHI:
SUSHI solves the challenge of object tracking over long video sequences by splitting long videos into smaller chunks, so the tracking process is more efficient and scalable. It uses Graph Neural Networks (GNNs) at every level of this hierarchy to maintain uniform processing over various time scales.

Key Features:
- Hierarchical Processing: Breaks down lengthy videos into smaller segments, facilitating efficient and scalable tracking.
- Unified GNN Architecture: Utilizes a shared GNN across all hierarchy levels to maintain consistency.
- Enhanced Performance: Delivers superior results on diverse datasets, showcasing its adaptability.

Relevance to our Project:
The hierarchical approach used by SUSHI fits into our project's objective of merging broken tracklets into full trajectories. SUSHI uses GNNs to capture the interactions between tracklets, which overcome occlusion and missed detection problems. Studying SUSHI's approach can provide useful knowledge for creating our tracklet merging algorithm.

Conclusion:
Gaining an understanding of the complexities in MOT and examining advanced approaches like SUSHI will aid in the creation of our offline tracklet merging algorithm. This foundational knowledge is essential for developing a robust solution that reconstructs complete and consistent object paths from fragmented tracklets.

WORK TO BE DONE NEXT WEEK

1. Exploratory Data Analysis: we will perform data analysis to better understand the dataset's structure

2. Structuring the data prompts: We will organize and structure the data prompts to ensure they are ready for the further analysis

3. Model Testing: We will try to make and run small pilot model to evaluate their performance.