

# Weekly Progress Report - Week 2

Improve existing online trackers by measuring feature evolution of objects using Classical Machine Learning models [UAV Videos]

Group: Epochalypse

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## Outline of Performed Tasks:

- Cloned and set up the BoxMOT repository locally
- Resolved dependency and environment configuration issues
- Studied BoxMOT codebase structure and tracking pipeline

## Detailed Problem Statement

**Motivation:** Most state-of-the-art MOT frameworks (e.g., ByteTrack, DeepSORT, BoT-SORT) rely heavily on deep convolutional neural networks for appearance feature extraction. In UAV footage, objects are:

- Small in scale
- Subject to rapid camera motion
- Frequently occluded
- Viewed from top-down perspectives

This project investigates whether classical feature representations (e.g., HOG, color histograms, contour/shape descriptors) combined with statistical learning methods can provide competitive identity preservation while being computationally lightweight.

## Tentative Tasks for Next Week

1. Analyze tracker-specific implementations (ByteTrack, DeepSORT, BoT-SORT) to understand differences in motion and appearance fusion.
2. Trace the ReID pipeline end-to-end and identify precise integration points for classical feature replacement.
3. Begin designing and implementing a modular framework to replace deep ReID embeddings with handcrafted classical features.