**Weekly Progress Report**

**Week 4: March 24, 2025 - March 29, 2025**

**Week Done:**

During this week, we successfully implemented **Segment Anything Model (SAM)** for segmentation tasks and explored different object detection models, including **RetinaNet** and **Detectron2**. Our primary focus was on understanding their performance in detecting objects from the **DOTA v1.5 dataset** and evaluating their accuracy, speed, and robustness in real-world scenarios.

**Key Implementations:**

1. **Segment Anything Model (SAM):**
   * Integrated **SAM** for segmentation-based tasks.
   * Processed dataset images to test SAM’s ability to generate high-quality segmentations.
2. **Object Detection Models:**
   * Implemented **RetinaNet** for object detection.
   * Set up **Detectron2** for accurate detection and instance segmentation.
   * Compared initial results between **RetinaNet and Detectron2**, analyzing their precision and performance on aerial images.

**Next Week’s Plan:**

* Extend evaluation to additional models such as **EfficientDet, Mask R-CNN, TricubeNet, and Faster R-CNN**.
* Perform a **detailed comparison** of these models based on metrics like **mAP (mean Average Precision), inference time, and computational efficiency**.
* Optimize hyperparameters to improve detection and segmentation accuracy.