**CV Project Weekly Update**

**Week 2: March 17, 2025 - March 22, 2025**

**Work Done:**

1. Model Setup and Environment Configuration:

- Cloned and set up the CFNet repository.

- Installed dependencies and configured the Python environment for running CFNet.

- Resolved import errors related to missing modules (network issue in CFNet).

- Set up SAM (Segment Anything Model) for segmentation tasks.

2. Oriented Bounding Box (OBB) Detection:

- Investigated OBB-DETR model for UAV image analysis.

- Identified and prepared necessary pre-trained weights.

- Explored instance segmentation using CFNet and SAM.

**3. Mask R-CNN for Object Detection & Segmentation:**

* Implemented **Mask R-CNN** for **DOTA v1 dataset**.
* Modified **classification and mask prediction layers** to handle **DOTA-specific classes**.
* Preprocessed images and applied **Mask R-CNN-based instance segmentation**.
* Debugged **bounding box visibility issues** and **optimized thresholding** for better mask accuracy.

Work Planned for Next Week:

1. Refining OBB Model Inference:

- Optimize the inference pipeline for UAV images.

- Compare results between CFNet, SAM, and OBB-DETR.

- Perform fine-tuning on CFNet and OBB-DETR using DOTAv1.5 dataset.

2. Evaluation Framework Development:

- Define key performance metrics for OBB model evaluation.

- Develop Python-based evaluation scripts for assessing accuracy and efficiency.

- Begin documentation for the evaluation framework.

3. Dataset Processing and Augmentation:

- Preprocess additional UAV images for training and validation.

- Experiment with data augmentation techniques to improve model generalization.

- Investigate alternative OBB detection models for potential integration.

4. Project Documentation and Open-Source Release:

- Structure the repository for easy public access.

- Begin writing initial documentation for users.

- Plan for a preliminary release of the evaluation framework.

This week focused on setting up the necessary models and resolving dependency issues. Next week will involve refining the pipeline, evaluating models, and starting the development of a structured evaluation framework.