METHOD DISCRIPTION:

we propose a novel orientation-adaptive multi-category small object detection model for aerial images. This model is built on the Faster R-CNN pipeline and ResNet101 backbone.

We first develop an accurate region proposal network (ARPN), which comprehensively fuses multi-scale feature maps to generate the hyper feature map to improve the detection performance for small objects. A variety of aspect ratios are set for anchors In addition, ARPN sets the aspect ratios of anchors as [1,1/2,2,1/3,3,1/4,4,1/5,5] to better fit multi-category objects in aerial images.

After a series of object proposals are made by ARPN, the detection model learns to generate rotated boxes and axis-aligned boxes. Rotated boxes can perfectly encircle objects, which can reduce the interference of noise on target detection. Each rotated box is associated with an axis-aligned box, adding the constraint by using axis-aligned boxes and rotated boxes at the same time can enhance the performance of the detector.

What's more, our model refines accurate detection results by utilizing rotated non-maximum suppression(Rotated NMS) in the post-processing phase.

Based on the above method, we achieved 0.723 and 0.726 mAPs in 'Task 1' and 'Task 2' respectively through data enhancement, multi-scale training test and model integration.

Ps ： The result of the tennis in task2 is 0 due to a commit error.