Ahmedabad University

CSE541 COMPUTER VISION

Weekly Report 3

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Project 1: Object detection techniques (in the case of small objects) on the AU Drone dataset

Week 2: Review of 2 Deep learning models

- EfficientDet: Scalable and Efficient Object Detection
- HoughNet: Integrating near and long-range evidence for bottom-up object detection

EffectiveDet

EfficientDet presents a novel family of object detectors that considerably enhance efficiency over a wide variety of resource restrictions, as described in the work "EfficientDet: Scalable and Efficient Object Detection" 1. The model demonstrates its efficiency and scalability by achieving state-of-the-art performance on the COCO test-dev with a single model and single-scale. In order to facilitate quick and simple multiscale feature fusion, EfficientDet integrates a weighted bi-directional feature pyramid network (BiFPN) with a compound scaling technique that concurrently and consistently scales the resolution, depth, and breadth for all networks. Models produced by this method are 4–9 times smaller and use 13–42 times less FLOPs than earlier detectors, which makes them ideal for applications with constrained computing resources.

HoughNet

In contrast, HoughNet concentrates on combining close- and far-range data for bottom-up item recognition. Although the search results did not provide specific information regarding HoughNet, it is known that this method frequently uses Hough Transforms to identify items in photos by shape, which can be very useful for recognising tiny objects in aerial photography. HoughNet is an appropriate option for aerial images where the context and scale of objects might vary greatly since it most likely makes use of the resilience and object detection capabilities of Hough Transforms.

Paper link:

- https://arxiv.org/abs/1911.09070
- https://arxiv.org/abs/2007.02355