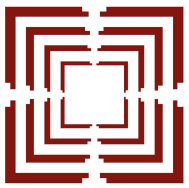

Ahmedabad
University

Machine Learning + Computer Vision Project

Group - 11

Week-2: Progress Report

Project title:

Evaluate performance of various object detection techniques (in case of small objects) on AU Drone dataset.

Group Members:
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Task performed in this week:

In the previous week, our group tried to understand the research paper 'QueryDet: Cascaded Sparse Query for Accelerating High-Resolution Small Object Detection' by Chenhongyi Yang, Zehao Huang, and Naiyan Wang.

The dataset the researchers have used to detect smaller objects are as follows:

- Visdrone
- COCO dataset

Summary of the research paper:
Main points the research paper regarding the Query-Det we have looked through to get an understanding and we observed it optimize the detection of small objects with better precision:
Why do we use Query-Det:
Main motivation (Two key observations):

1. The computation on low-level features is highly redundant.
   In most cases, the spatial distribution of small objects is very sparse: they occupy only a few portions of the high-resolution feature maps; hence a large amount of computation is wasted.
2. The feature pyramids are highly structured.
   Though we cannot accurately detect small objects in low-resolution feature maps, we can still infer their existence and rough locations with high confidence.

In simple terms, Query-Det first detects the large object in low resolution with fast speed, and other parts of the image further go for detection with high resolution for small object detection.

The task to be performed in the next week:

- Try to start understanding the coding part of this paper and other coding parts we need.
- Use vis-drone data on a simple object detection model to evaluate one performance matrix and for other visualization, which can help to understand the topic better for the mid-sem presentation.

References:

- https://arxiv.org/abs/2103.09136
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