UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Engineering, Built Environment and IT
Department of Computer Science

COS791

Image Analysis and Understanding

Assignment Two - Object Detection

Due: 28 October 2025

Instructions

1. This is an individual assignment.

2. Plagiarism is not allowed.

3. The use of libraries is permitted. You may use any programming language of your choice.

4. The assignment consists of 1 task.

5. The assignment carries a total of 25 marks.

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1. This is an object detection task. The task involves building an object detection model using YOLOv12 (nano or small). The following sub-tasks need to be performed:

   a) You are given three datasets (training, validation and test) containing image(s) of an animal of interest.
   b) Annotate (insert bounding boxes) the dataset. (Hint: e.g., LabelImg, CVAT, VoTT, etc.)
   c) Create a YOLOv12 model and train it using the annotated dataset.
   d) Test your application on the test set.
   e) Your code should be able to test a video(.mp4) containing the animal of interest.
   f) This assignment will be marked through a demo. Before the demo, a short test video will be made available to you, and your model should be able to detect the presence of the animal of interest.

2. You are to submit a zipped folder containing the code, your annotated training dataset, and a report detailing the following:

   i) Theoretical background and evolution of YOLO.
   ii) Practical weaknesses of YOLO.
   iii) Details of your model design and approach.
   iv) Results of model performance.
   v) Critical analysis and conclusion.