**Data Science and Artificial Intelligence (DSAI)**

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**Dept: AI**

**Section: 4**

**Topic: Object Detection**

**Setting up Darknet for YOLOv4:**

Clones the Darknet repository from AlexeyAB's GitHub.

Modifies the Makefile to enable GPU, OPENCV, CUDNN, and LIBSO.

Builds Darknet with the specified configurations.

Downloads pre-trained YOLOv4 weights file from Google Drive.

**Loading YOLOv4 Model:**

Loads the YOLOv4 model, class names, and class colors using the Darknet library functions**.**

**Helper Functions:**

**darknet\_helper:** Takes an image as input, processes it for object detection using the YOLOv4 model, and returns detections along with width and height ratios.

**js\_to\_image:** Converts a JavaScript object containing an image from the webcam into an OpenCV BGR image.

**bbox\_to\_bytes:** Converts an OpenCV rectangle bounding box image into a base64 byte string for overlaying on the video stream.

**Webcam Image Processing:**

Defines a JavaScript function take\_photo to capture an image from the webcam and run YOLOv4 object detection on it.

Utilizes the video\_stream function to create a live video stream from the webcam.

Runs YOLOv4 object detection on each frame from the webcam stream and overlays bounding boxes and labels on the frames.

The processed frames are then displayed as a live video stream with real-time object detection results.

To make a precise assessment or any specific changes to the code, please let me know what specific aspects you need assistance with or any issues you're facing.