Wobot.ai Assignment

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Year: 4th (B.Tech)

Stage 2: Find the colour

Q] Hardhat/ Head detection using Deep learning techniques from the given dataset and detecting the color of the helmet

A] Methodology:

Step 1: Cropping the image in terms of bounding boxes of the yolo prediction.

Step 2: Using only ‘helmet’ cropped bounding boxes to find the dominant color in the image using Kmeans clustering technique.

Step 3: Returning the dominant color to change the color of the bounding box in real time.

B] Reasons why Kmeans was chosen to detect the dominant color :

- **The helmet covers most of the part of the bounding box, so should have the dominant color of the image.**
- **K-means clustering algorithm is used to find groups which have not been explicitly labeled in the data, this could be useful to find the dominant color within an image.**

C] Difficulties faced and action taken on them:

- **Selecting the number of clusters to get a better sense of various dominant color was a challenge, after some trial-and-error n was kept as 3.**
- **3 channel image was not compatible for K-Means, which was later reshaped into 2-dimensional array.**

D] Results:

- **Hardhat/ head has been detected with the bounding box along with the percentage of the detecting has been printed on top of the box.**
- **The color of the bounding box has been changed to white as the dominant color of the image and also the color of the hardhat.**
- **The change in bounding box only works when the class detected in 'helmet', for 'head' it will have pink colored bounding box.**

***All The codes along with weights files is uploaded in the zip file, you can also try using weights at your end.**

*** The Result video is also been uploaded.**

E] References:

- **https://github.com/mrakelinggar/data-stuffs/blob/master/frequent_color/common%20colors.ipynb**