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**WiDS ‘22 - ‘23 Final Documentation**

**<Object detection and tracking using yolo>**

**<Yash Choudhary>**

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| **Team Member Name** | **Roll Number** | **Email-Id** |
| Prachit Gupta | 210100111 | prachitgupta30@gmail.com |
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**Introduction to Problem Statement**

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| Task was to detect cars in an random mp4 video using yolo algorithm and as an add -on feature classify them according to their colour.  Also we were required to generate a collab notebook containing various pre processing methods we can perform on any image and generate our own dataset and train it using yolo algorithm |

**Existing Resources**

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| <https://www.youtube.com/playlist?list=PLA83b1JHN4ly56Y7o6vDAT8Szxc3_EdRH>  <https://www.v7labs.com/blog/yolo-object-detection>  <https://github.com/roboflow/notebooks/blob/main/notebooks/train-yolov8-object-detection-on-custom-dataset.ipynb>  Opencv documentation |

**Proposed Solution**

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| Generate a image database from the video of traffic i selected  Use roboflow web to generate dataset from those images performing preprocessing/augmentation to just enhance dataset  Train data set using yolo  Deploy generated object detecting model to roboflow to be used on any dataset |

**Methodology & Progress (Mention the work done week-wise)**

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| Week 1 : dive into world of data science, got familiar with AI , mL deep learning cnn and associated algorithms , just an intuitive idea of how they work  Week 2: Use roboflow software to generate dataset, revised my pre existing knowledge of image processing, generate a google collab notebook performing various pre processing  Week3: Introduction to Yolo, How to train dataset in yolo theory  Then I implemented yolo on the dataset i generated and made a separate collab notebook  General methodology  1)wrote a code to extract frames from a video every 12s and store the imaged in a directory  2)uploaded the images generated to roboflow and annotated 40-50 of the uploaded images  3)performed required preprocessing and augmentation steps on images to generate a dataset of above 200 images  4)exported datset to google collab environment from roboflow  5)installed ultralytics yolo and roboflow on a collab running on GPU environment  6)trained object detection model on custom datset generated using CLI provided by ultralytics yolov8  7)displayed some test results and validated model on an image not in training dataset before deploying model to roboflow |

**Results**

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| <https://drive.google.com/drive/folders/1uNxkLB7wjomb10R-YVPt7myTUNOVs3iy?usp=sharing>  The above drive link contains 1)collab notebook containing various preprocessing steps performed on images  2)custom dataset created using roboflow  3)collab notebook containing code for exporting data to collab environment and train a object detection model for dataset generated |

**Learning Value**

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| **Awesome introduction to ML and datascience**  **In depth hands on experience in image processing**  **Idea of YOLO algorithm and how to use it to train dataset**  **To create my own dataset** |

**Tech-stack Used**

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| <https://www.youtube.com/playlist?list=PLA83b1JHN4ly56Y7o6vDAT8Szxc3_EdRH>  <https://www.v7labs.com/blog/yolo-object-detection>  <https://github.com/roboflow/notebooks/blob/main/notebooks/train-yolov8-object-detection-on-custom-dataset.ipynb>  <https://www.youtube.com/watch?v=oXlwWbU8l2o&t=8787s>  <https://www.youtube.com/watch?v=wuZtUMEiKWY>  <https://towardsdatascience.com/introduction-to-machine-learning-for-beginners-eed6024fdb08> |

**Suggestions for others**

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| Don’t give up when faced with overwhelming and weirdly annoying technical errors  These our integral part of any tech project |

**Contribution by each Team Member**

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| NA |

**References and Citations**

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| [*https://docs.google.com/document/d/1GUP4KPSI2Y17IZgsXQziXLUHa8O3k9hUpEjnV9btZ9U/edit*](https://docs.google.com/document/d/1GUP4KPSI2Y17IZgsXQziXLUHa8O3k9hUpEjnV9btZ9U/edit)  *-mentor Yash Choudhary* |