YOLO-Neural Architecture Search

INTRODUCTION:

To implement this project, we are utilizing YOLO-NAS, which offers a performance improvement of 10-20% in speed compared to YOLO versions 7 and 8. For dataset preparation, we are leveraging the Roboflow platform to convert the dataset into the YOLO format. The model will be trained using this prepared dataset.

DATA COLLECTION:

We took the data collection from the following resource

Link: https://www.kaggle.com/datasets/ahmadahmadzada/images2000

DATA SET: Using the roboflow data labelling feature we have annotated the data. We used 200 images to train the model.

CODE EXPLAINATION:

Cell 1: Installing roboflow

Cell2: This sample of code shows how to download a dataset in the format required by the YOLOv9 object detection model using the Roboflow library. The Roboflow class is imported first, and an instance is created using an API key for authentication. The script then uses the Roboflow platform to access a particular workspace and project. The dataset ready for YOLOv9 is downloaded after choosing the project's version 1. This procedure gets the dataset ready for utilizing in the YOLOv9 framework to train or test an object detection model.

Cell3: This code explains how to forecast a local image using a Roboflow model and see the output. It retrieves the model linked to a certain project version, applies predefined overlap and confidence levels to forecasts on a given local image, and outputs the outcomes in JSON format. By exporting the image with the anticipated bounding boxes to a given file path, the code additionally visualizes the predictions. There is also an example of making predictions on an internet image that has been commented out.

Cell 4: This code snippet demonstrates how to use a Roboflow model to make predictions on a local image and save the results. It sets the path for saving the predicted image, prints prediction results in JSON format with a confidence threshold of 40% and an overlap of 30%, and then saves the image with visualized predictions to the specified file path.

TRAINING GRAPHS & RESULT: