Data Annotation and Preprocessing Process

The purpose of this task was to provide a comprehensive dataset for training object identification models that could recognize and locate pedestrians, traffic signals, and vehicles in real-world scenarios. Accurate object identification is critical for a variety of applications, including self-driving cars, traffic control, and security systems. This dataset was created with the intention of presenting a broad and representative sample of these objects under various circumstances.

Image Acquisition

Images for this dataset were obtained from Google Images. A careful effort was taken to ensure that the images were relevant and of high quality. Keywords used in the search included "pedestrian crossing," "traffic signs intersection," "vehicles on road," "car traffic jam," "pedestrian walking street," and various combinations thereof. A manual review process was used to remove irrelevant or low-quality photographs. Specifically, images with severe blur, low quality, or solely creative renditions were eliminated. Furthermore, photographs with potentially sensitive or inappropriate content were carefully avoided.

Annotation Process

The annotation process was carried out using Roboflow, a platform designed for computer vision dataset creation. Roboflow's bounding box and polygon annotation tools were utilized. The following classes were defined for annotation:
Pedestrian: Includes all human beings on foot, regardless of age, clothes, or posture.
Driver: Identifies specific individuals who operate a vehicle. This distinction was developed so that models may be trained to distinguish between drivers and pedestrians.

Vehicles: include cars, trucks, buses, motorbikes, and other powered vehicles.

Traffic Sign: Covers a wide range of traffic signs, including regulation, warning, and informational signs. While more sub-classification of signals would be desirable in future study, this initial dataset treats all indicators as a single class.

The dataset is 80/20 split. Out of 150 photos, 80 are in the training set and 30 are in the testing set.

Challenges and Solutions

Image Variability: A variety of image sources and situations posed a difficulty to annotation uniformity. Solution: Detailed rules were created, refined, and reviewed on a regular basis to maintain consistency.

Object Obstruction: Limited object visibility made correct annotation difficult. Solution: Annotators focused on visible areas and used context to infer full extent, adhering to accepted occlusion criteria.

Small Objects: It was difficult to annotate distant traffic signs appropriately. Polygon annotations and Roboflow's zoom functionality were used to achieve accurate localization.

Class Imbalance: Initially, more automobiles were collected than pedestrians or signs. Solution: Targeted searches were undertaken to balance class distribution. Data augmentation will be explored as a future upgrade.