PPE_Detection Object Detection Dataset Presentation

May 2025

1 Introduction

Personal Protective Equipment (PPE) is essential for ensuring worker safety in industries such as construction, manufacturing, and healthcare. Automated PPE detection using computer vision enhances safety by identifying compliance with regulations, reducing accidents caused by missing or improperly worn equipment.

The PPE_Detection dataset, hosted on Roboflow Universe, is a collection of images annotated with PPE items, designed to train object detection models for workplace safety applications. This presentation explores the dataset's features, potential uses, and access details.

2 Dataset Overview

Created by a user named "Project" on Roboflow, the PPE_Detection dataset (version v1, updated June 17, 2023) contains 3,290 images. It includes annotations for seven classes, though their exact names are not publicly listed. Based on standard PPE categories, the classes are assumed to be:

- Helmet
- Safety Vest
- Gloves
- Safety Shoes
- Face Mask
- Eye Protection (Goggles)
- Ear Protection (Earplugs)

The dataset is licensed under CC BY 4.0, allowing free use, sharing, and adaptation with proper attribution. It is accessible via `https://universe.roboflow.com/project-uyrxf/ppe_detection-v1x3l`.

3 Dataset Statistics

The dataset likely follows Roboflow's standard split, though exact annotation counts are unavailable. The seven classes cover a range of PPE items, but users may need annotation files for precise class names.

Table 1: PPE_Detection Dataset Statistics

Attribute	Details
Total Images	3,290
Classes	7
Class IDs	0, 11, 3, 4, 6, 8, 9
Assumed Class Names	Helmet, Safety Vest, Gloves, Safety Shoes, Face Mask, Goggles, Earplugs
Dataset Split	Train (70%, ∼2,303 images), Validation (20%, ∼658 images), Test (10%, ∼329 images)
Total Annotations	Not specified

4 Classes

The dataset annotates seven classes with IDs 0, 11, 3, 4, 6, 8, and 9. Without explicit names, we infer they include common PPE items like helmets and safety vests, aligning with similar datasets. This assumption is based on classes in other PPE datasets, such as those listing helmets, vests, and gloves.

5 How to Use the Dataset

Available on Roboflow Universe, the dataset supports multiple download formats, including:

- Pascal VOC XML
- COCO JSON
- Darknet TXT
- TFRecord
- PaliGemma JSONL
- CreateML JSON

A pre-trained PPE_Detection model is provided for immediate use or fine-tuning. Users can train custom models using frameworks like YOLO or EfficientDet, leveraging the dataset's annotations for PPE detection tasks.

6 Use Cases

The dataset supports various applications, including:

- **Workplace Safety Monitoring**: Real-time PPE compliance detection in industrial settings.
- **Compliance Auditing**: Automating safety regulation checks to reduce manual inspections.
- **Training and Simulation**: Demonstrating proper PPE usage in safety programs.
- **Research**: Benchmarking object detection models for PPE-related tasks.

7 License and Attribution

Licensed under CC BY 4.0, the dataset is freely usable with attribution. The recommended citation is:

```
@misc{ppe_detection-v1x3l_dataset,
    title = {PPE_Detection Dataset},
    type = {Open Source Dataset},
    author = {Project},
    howpublished = {\url{https://universe.roboflow.com/project-uyrxf/ppe_detection-v1x3l}},
    url = {https://universe.roboflow.com/project-uyrxf/ppe_detection-v1x3l},
    journal = {Roboflow Universe},
    publisher = {Roboflow},
    year = {2023},
    month = {aug},
    note = {visited on 2025-04-25},
}
```

8 Conclusion

The PPE_Detection dataset is a valuable resource for developing computer vision models to enhance workplace safety. With 3,290 images and seven assumed PPE classes, it supports applications from real-time monitoring to compliance auditing. Its accessibility on Roboflow and open-source license make it a practical choice for researchers and developers.