Reviewing of Personal Protective Equipment Image Datasets

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Abstract:

The escalating need for Personal Protective Equipment (PPE) during the COVID-19 pandemic has intensified research into technologies for the detection and recognition of PPE usage. This paper reviews a variety of image datasets pivotal in developing algorithms capable of accurate PPE detection and compliance monitoring across diverse environments such as hospitals, construction sites, and manufacturing facilities. We assess datasets like the SHWD, the GDUT-HWD, the COVID-19 Personal Protective Equipment Dataset, among others, focusing on their composition, quality, and the annotations they offer. These datasets vary significantly in their size, the specificity of PPE items included, and their potential applications for training object detection models. Our analysis emphasizes the importance of dataset characteristics in the effectiveness of machine learning models, and we highlight the need for datasets that represent a wide range of PPE types and usage scenarios to enhance the accuracy and applicability of PPE detection technologies. This review aims to guide future developments in PPE detection, ensuring technologies are both effective in real-world applications and supportive of ongoing efforts to maintain safety protocols in various industrial and healthcare settings.

Keywords:

Personal Protective Equipment, Image Datasets, Machine Learning, COVID-19, Safety Compliance, Object Detection.