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Final Product Reflection

Positives

This final product will be beneficial in the construction work to increase the workers’ safety through passive hardhat detection and potentially a warning system implemented with it. It also provides a hardhat detection model that anyone can use if it is needed in some other projects. By uploading the model in public for open-source use, anyone who needs it can use it. Since the format is easily convertible to different common object detection models such as ONNX or TensorFlow Lite, it will be even more beneficial to them. In addition, this product could be used as a foundation for different types of Personal Protective Equipment (PPE) detection to increase the scope of what is being scanned in construction workplaces to increase worker safety.

Negatives

As a high school student working alone on a custom object detection model, the time, skill, and the labor force is lacking to create a very precise object detection model. With more images annotated and trained, the same model could be much more powerful. However, since hardhats are pretty distinct compared to their surroundings, and since 100 images are also not lackluster, it is a solid model for most hardhat detection use cases. Another negative is that it may have been better if a well-refined mobile application just for the hardhat detection model was created, however, this is not necessarily innovative as an alternative solution to it already exists, and creating one does not necessarily make any progress to what has been already done in this world.

Creative Inspiration

So much could be done with a similar idea of this product. Object detection, like other artificial intelligence-based algorithms, looks for patterns, and patterns are everywhere in the universe. For nearly any field, such artificial intelligence could be implemented to improve and automate what is being done currently. In more specific cases, such as construction sites, this model could be expanded to detect more objects in those construction sites, such as other PPEs or even construction equipment so that the system can warn workers of potential dangers it detects.

Outlook

In this final product, a more specific field of artificial intelligence—object detection through machine learning—was used. From this experience, it was even more evident that on a broader scope, the emerging field of artificial intelligence as a whole is going to change what everyone thought about as the norm. This tool is very powerful and can be both ethical or unethical and beneficial to humanity or harmful to humanity. It all depends on who uses it in what way. While that may be scary, it could be a key to solving crucial world problems, such as hunger, diseases, wars, climate change, and more. Rather than stepping away, research and work should be conducted to develop and guide these technologies for the benefit of humanity, which I hope to be part of in the near future.