Analyzing the Effects of Augmentation Methods on Icon Detection through Machine Learning

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The ability to recognize and interact with components of computer interfaces is frequently crucial for effectively streamlining complex processes [1]. A major challenge in this process is the icons. These are recognizable symbols that are usually used in software and applications because their visual representation and functionality are governed by a set of design principles. Nonetheless, automated identification presents challenges because their aesthetic criteria are confined within a limited set of applications and are subject to alteration based on the unique requirements of new applications.

Our study addresses the problem of accurately distinguishing application icons while attempting to avoid the extensive use of various image datasets. For this purpose, we introduce two well-known models: YOLOv8 [2] and Faster R-CNN [3]. Our main goal is to establish whether a large collection of distinctive images is necessary or whether one image augmentation technique can be sufficient to improve the performance of the models.

The experimental findings show that a familiar method, like image rotation, significantly improves the effectiveness of both models in icon detection. It is therefore convincing that a large variety of images in the dataset may not be necessary to achieve a high accuracy in this stated problem.

References

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