Investigation Of Robustness In Dcnns For Crack Segmentation

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In recent years, deep convolutional neural networks (DCNNs) have gained popularity for image-based crack segmentation due to their outstanding performance, self-adaptability, and reduced subjectivity. Despite the many advantages offered by DCNNs, their development is a complex and time-consuming task that requires the selection of hyperparameters, which in turn affects the performance of the resulting DCNNs. In addition, the performance of DCNNs also depends on the choice of metrics adopted. Although with many influential factors, the robustness of the obtained DCNNs has rarely been revealed or discussed. In this paper, a series of DCNN crack segmentation models are obtained using a variety of hyperparameters in combination with different metrics for semantic segmentation. Then a comprehensive analysis program is conducted to evaluate their robustness. This study characterizes the relations between the DCNN segmentation performance and the selected hyperparameters and offers insights into the robustness of the performance of the obtained DCNN models.