

ANOMALY DETECTION AND LOCALIZATION IN IMAGES USING GUIDED ATTENTION

Anonymous authors

Paper under double-blind review

ABSTRACT

Anomaly detection and localization is a popular computer vision problem which involves detecting anomalous images and localizing anomalies within them. However, this task is challenging due to small sample size and pixel coverage of the anomaly in real-world scenarios. Previous works have a drawback of using anomalous images to compute a threshold during training to detect and localize anomalies. To tackle these issues, we propose AVAGA - the first end-to-end trainable convolutional adversarial variational autoencoder (CAVAE) framework using guided attention which localizes the anomaly with the help of attention maps. AVAGA detects an image as anomalous from the large pixel-wise difference between the input and reconstructed image. In an unsupervised setting, we propose a guided attention loss, where we encourage AVAGA to focus on all non-anomalous regions in the image without using any anomalous images during training. Furthermore, we also propose a selective gradient backpropagation technique for guided attention, which enhances the performance of anomaly localization while using few anomalous images in a weakly supervised setting. AVAGA outperforms the state-of-the-art (SoTA) methods for anomaly detection and localization.