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## Edge-preserving smoothing filters for improving object classification

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### Abstract

Edge-preserving smoothing filters have had many applications in the image processing community, such as image compression, restoration, deblurring and abstraction. However, their potential application in computer vision and machine learning has never been fully studied. The most successful feature descriptors for image classification use gradient images for extracting the overall shapes of objects, thus edge preserving filters could improve their quality. The effects of various edge-preserving filters were evaluated as a pre-processing step inhuman detection. In this work, three smoothing filters were tested, namely the total variation (TV), relative total variation (RTV) and L0 smoothing. Significant performance gains were realised with TV and RTV for both colour and thermal images while the L0 smoothing filter only realised a slight improvement on thermal images and poorer performance on colour images. These results show that smoothing filters have a potential to improve the robustness of common statistical learning classifiers.