

Image-Based Fire Detection Using Neural Networks

An image-based fire detection method using neural networks is proposed in this paper. First, flame color features, based on the HSI color model, are trained by a backpropagation neural network for flame recognition. Then, based on the learned flame color features, regions with fire-like colors are roughly separated from an image. Besides segmenting flame regions, background objects with similar fire colors or resulted from the reflection of fire flames are also separated from the image. In order to get rid of these spurious fire-like regions, the image difference method and the invented color masking technique are applied. Finally, a compact method is devised to estimate the burning degree of fire flames so that users could be informed with a proper warning alarm. The proposed system can achieve 96.47% fire detection rate on average.