Infrared Thermal Images Classification for Pressure Injury Prevention Incorporating the Convolutional Neural Networks

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Abstract

Currently, Infrared thermal imaging technology is the best way to solve this problem, which takes advantage of receiving infrared radiation from some parts of the scene itself. Thus, early detection and prevention is the only way to reduce the incidence of PI(Pressure injury).infrared thermal images were shoot and labelled with the normal group to be trained in database.This measure should be performed in high-risk populations to reduce the incidence of pressure injury. Using thermal imaging to document PIs when patients present has the potential to significantly reduce expenses associated with pressure injury litigation. The clinical and financial benefits of early documentation of skin surface thermal anomalies in anatomical areas of interest are significant. Thus, early detection and prevention is the only way to reduce the incidence of PI. However, there are some difficulties in clinical care carrying out the PI precaution. For one thing, the present clinical application of risk assessment scales are unable to achieve an objective and accurate assessment for early detection of the risk of pressure injury. After image processing mainly including image resizing and data augmentation, we proposed the PI predictive model based on collected images and CNN. In addition, to evaluate the performance of the obtained CNN model, we applied two of the machine learning algorithms to build the predict model as well. All the training process were employed 4-fold cross validation to test the classification results. In this procedure, Gray level co-occurrence matrix (GLCM) was used to extract the original image texture features like variance, entropy, and so on. Two methods of feature selection were also involved to assess the importance of the extracted features. Thus, early detection and prevention is the only way to reduce the incidence of PI.