Stitching method for panoramic nailfold images based on capillary contour enhancement

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Abstract

Nailfold capillaroscopy is an important means of monitoring human health. Panoramic nailfold images improve the efficiency and accuracy of examinations. However, the acquisition of panoramic nailfold images is seldom studied and the problem manifests of few matching feature points when image stitching is used for such images. Therefore, this paper presents a method for panoramic nailfold image stitching based on vascular contour enhancement, which first solves the problem of few matching feature points by pre-processing the image with contrast-constrained adaptive histogram equalization (CLAHE), bilateral filtering (BF), and sharpening algorithms. The panoramic images of the nailfold blood vessels are then successfully stitched using the fast robust feature (SURF), fast library of approximate nearest neighbors (FLANN) and random sample agreement (RANSAC) algorithms. The experimental results show that the panoramic image stitched by this paper's algorithm has a field of view width of 7.43 mm, which improves the efficiency and accuracy of diagnosis.

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