

An Image Stitching Approach for Scoliosis Analysis

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Abstract : Standard X-ray spine images produced by conventional screen-film technique have a limited field of view. This limitation may obstruct a complete inspection of the spine unless images of different parts of the spine are placed next to each other contiguously to form a complete structure. Another solution to producing a whole spine image is by assembling the digitized x-ray images of its parts automatically using image stitching. This paper presents a new Medical Image Stitching (MIS) method that utilizes Minimum Average Correlation Energy (MACE) filters to identify and merge pairs of x-ray medical images. The effectiveness of the proposed method is demonstrated in two sets of experiments involving two databases which contain a total of 40 pairs of overlapping and non-overlapping spine images. The experimental results are compared to those produced by the Normalized Cross Correlation (NCC) and Phase Only Correlation (POC) methods for comparison. It is found that the proposed method outperforms those of the NCC and POC methods in identifying both the overlapping and non-overlapping medical images. The efficacy of the proposed method is further vindicated by its average execution time which is about two to five times shorter than those of the POC and NCC methods.

Keywords : image stitching, MACE filter, panorama image, scoliosis

Conference Title : ICCCISE 2015 : International Conference on Computer, Communication and Information Sciences, and Engineering

Conference Location : Jeddah, Saudi Arabia

Conference Dates : January 26-27, 2015