

Automated Feature Detection and Matching Algorithms for Breast IR Sequence Images

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Abstract : In recent years, infrared (IR) imaging has been considered as a potential tool to assess the efficacy of chemotherapy and early detection of breast cancer. Regions of tumor growth with high metabolic rate and angiogenesis phenomenon lead to the high temperatures. Observation of differences between the heat maps in long term is useful to help assess the growth of breast cancer cells and detect breast cancer earlier, wherein the multi-time infrared image alignment technology is a necessary step. Representative feature points detection and matching are essential steps toward the good performance of image registration and quantitative analysis. However, there is no clear boundary on the infrared images and the subject's posture are different for each shot. It cannot adhesive markers on a body surface for a very long period, and it is hard to find anatomic fiducial markers on a body surface. In other words, it's difficult to detect and match features in an IR sequence images. In this study, automated feature detection and matching algorithms with two type of automatic feature points (i.e., vascular branch points and modified Harris corner) are developed respectively. The preliminary results show that the proposed method could identify the representative feature points on the IR breast images successfully of 98% accuracy and the matching results of 93% accuracy.

Keywords : Harris corner, infrared image, feature detection, registration, matching

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