Reviewer's report

**Title:** Automatic registration of multi-modal microscopy images for integrative analysis of prostate tissue sections

**Version:** 2 **Date:** 12 March 2013

**Reviewer:** Yiqiang Zhan

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This paper presents an automatic registration method to fuse information from multi-modal microscopy prostate images. Specifically, SIFT is first applied to detect a set of landmarks in both image. RANSAC is then performed to remove outliers. Finally, the remaining corresponding inliers are used to derive spatial transformation between two images. In general, this work combines several existing method to tackle an interesting medical problem. Although the technical novelty is limited, this work is a pioneer study to register multi-modal microscopy images using advanced computer vision algorithms. Most important, this study opens the window to integrate information from different microscopy prostate, which will benefit the diagnosis of prostate cancer and other relevant clinical studies. Most parts of the paper are well presented. Sufficient experiments are carried out to validate the performance.

This paper can be further improved in the following aspects.

1. (Minor Essential Revisions) The accuracy of the method is measured by “success rate”. However, the criterion of “success” is not clearly presented. Is it based on subjective judgment of a pathologist? Or is there any more concrete definition of “success”? The authors need to clarify it.

2. (Minor Essential Revisions) The authors presented the proportion of computation time of different modules. However, the speed of the total algorithm is missing. Please provide it in the revised version.

3. (Minor Essential Revisions) Some relevant literatures are missing. For example, [1] also used landmark-based approach to register histological and MR images. It should be cited in the literature review section.

[1] Registering histological and MR images of prostate for image-based cancer detection

Y Zhan et.al., Academic radiology 14 (11), 1367

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a
statistician.