

## Overview

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**Automated video-mosaicking approach for confocal microscopic imaging in vivo: an approach to address challenges in imaging living tissue and extend field of view.**

*Kose K, Gou M, Yélamos O, Cordova M, Rossi AM3, Nehal KS, Flores ES, Camps O, Dy JG, Brooks DH, Rajadhyaksha M. Sci Rep. 2017 Sep 7;7(1):10759. doi: 10.1038/s41598-017-11072-9.*

### ABSTRACT

We describe a computer vision-based mosaicking method for in vivo videos of reflectance confocal microscopy (RCM). RCM is a microscopic imaging technique, which enables the users to rapidly examine tissue in vivo. Providing resolution at cellular-level morphology, RCM imaging combined with mosaicking has shown to be highly sensitive and specific for non-invasively guiding skin cancer diagnosis. However, current RCM mosaicking techniques with existing microscopes have been limited to two-dimensional sequences of individual still images, acquired in a highly controlled manner, and along a specific predefined raster path, covering a limited area. The recent advent of smaller handheld microscopes is enabling acquisition of videos, acquired in a relatively uncontrolled manner and along an ad-hoc arbitrarily free-form, non-rastered path. Mosaicking of video-images (video-mosaicking) is necessary to display large areas of tissue. Our video-mosaicking methods addresses this need. The method can handle unique challenges encountered during video capture such as motion blur artifacts due to rapid motion of the microscope over the imaged area, warping in frames due to changes in contact angle and varying resolution with depth. We present test examples of video-mosaics of melanoma and non-melanoma skin cancers, to demonstrate potential clinical utility. PMID: 28883434  
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