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CREATING PANORAMIC AERIAL IMAGES FROM QUADCOPTER

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Abstract. The paper considers the approach to forming panoramic images representing highly detailed images of some area. To obtain high-quality panoramic images, there is a need in specialized equipment and, if possible, the maximum survey altitude. These factors can be excluded if stitching the images from cameras of inexpensive unmanned aerial vehicles, i.e. quadcopters. One of the approaches to forming panoramic images is using a set of images or video sequence data obtained when surveying by a quadcopter or other unmanned aerial vehicle.

Images are stitched by the methods of matching point features. However, feature points detection algorithms should ensure invariance to any transformations of an image in order to analyze data and generate panoramic images. The research includes applying such algorithms such as FAST, FAST-ER and SURF due to the fact that they are currently the most common solutions for such task. The algorithms for determining correspondences of found feature points are RANSAC and MLESAC.

The paper proposes the algorithm of creating a panoramic aerial image from a set of successive landscape images from an unmanned aerial vehicle based on matching key features. The authors also use panoramic image global adjustment through affine processing. A special attention is paid to stitching images using multi-band blending techniques. This provides high-quality visualization in the stitching places of a panoramic aerial image.

Keywords: feature point detectors, FAST, SURF, panoramic aerial image.

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