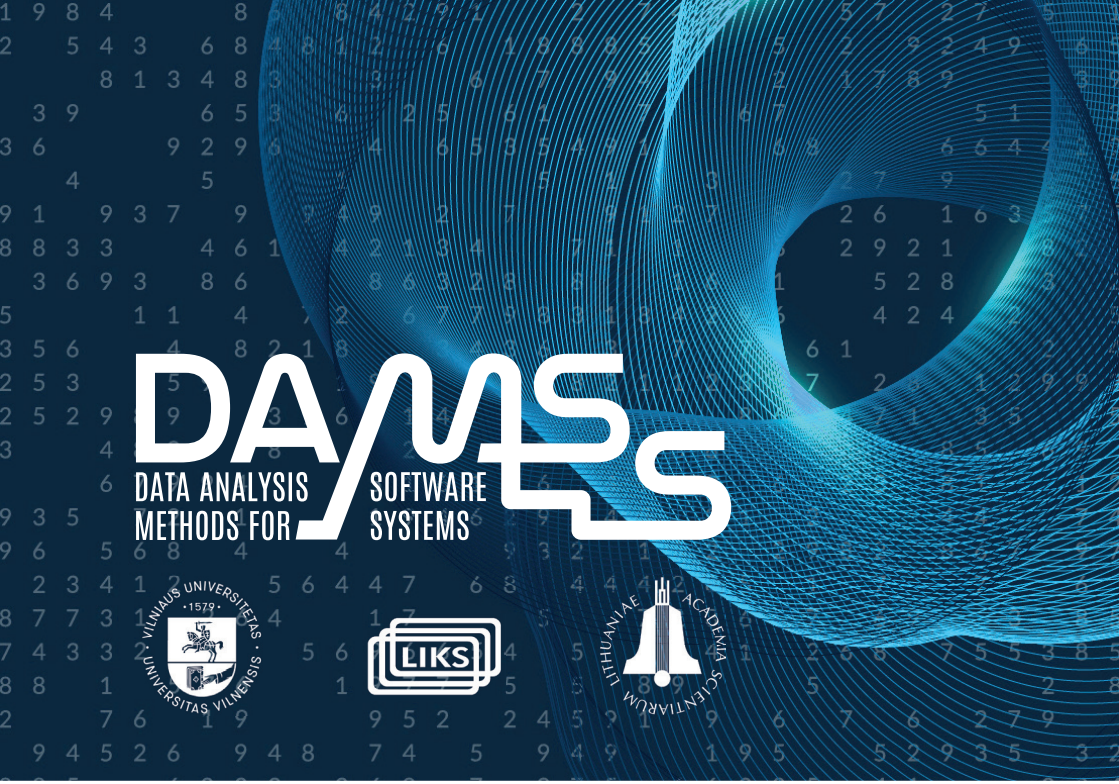

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Multi-Source Data Merging of Orthoimagery and Satellite Imagery for Deep Learning

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The satellite image processing has a lot of new applications in recent years. Open-access satellite data, such as Sentinel-2, of 10 meters, is often not sufficient for computer vision problems. While high-resolution images could be ordered by specialized satellites, the topic of super-resolution images has had a lot of breakthroughs in recent years, too; however, high-resolution data is necessary. Another approach for improving the data labels is the usage of orthophoto images taken by planes or unmanned aerial vehicles (UAV).

In this research, we presenting the results on merging Lithuanian landscape data of orthophoto images and satellite images. The investigated data contains the orthophoto images from the National Land Service under the Ministry of Environment and Sentinel-2 satellite images. The Lithuanian landscape data is analysed from raw TIFF format, which contains RGB colour channels.

The image splitting to patches is done using a sliding window approach. The alignment of orthophoto and satellite images is done by the image registration. The image transformation mapping is done by the OpenCV library. The image transformation mapping is done by the feature matching and homography transformation. The homography transformation is done by the RANSAC algorithm.

The image alignment and mapping problems are presented in this research.

The following merged data sources are prepared for the deep learning model training. The existing segmentation masks are mapped to the high-resolution orthophoto images. The new masks are corrected based

on high-resolution data. The new corrected masks are updated for Sentinel-2 satellite image format.

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