

IMAGE SEQUENCE PROCESSING IN STEREOVISION MOBILE MAPPING – STEPS TOWARDS ROBUST AND ACCURATE MONOSCOPIC 3D MEASUREMENTS AND IMAGE-BASED GEOREFERENCING

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ABSTRACT:

Stereo vision based mobile mapping systems enable the efficient capturing of directly georeferenced stereo pairs. With today's camera and storage technologies imagery can be captured at high data rates resulting in dense stereo sequences. The overlap within stereo pairs and stereo sequences can be exploited to improve the accuracy and reliability of point measurements. This paper aims at robust and accurate monoscopic 3d measurements in future vision-based mobile mapping services. Key element is an adapted Least Squares Matching approach yielding point matching accuracies at the subpixel level. Initial positions for the matching process along the stereo sequence, are obtained by projecting the matched point position within the reference stereo pair to object space and by reprojecting it to the adjacent pairs. Once homologue image positions have been derived, final 3D point coordinates are estimated. Investigations with real-world data show, that points can successfully and reliably be matched over extended stereo sequences.

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