

LASER SCANNER CALIBRATION USING SCANS OF TEST POLYGON

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The article deals with the implementation of the calibration technology of the ground laser scanner on the scans of the test site with the use of power polynomials. Laser scanner, like any other measuring device, needs periodic maintenance and verification, besides during the operation of the scanner, its measurement accuracy gradually deteriorates and, ultimately, ceases to meet the manufacturer's specifications.

Thus, the problem of calibration of the ground-based laser scanner is relevant and its solution will allow to restore the required measurement accuracy.

The aim of this work was to develop and implement a universal mathematical apparatus for calibration of ground-based laser scanner, which, taking into account the design and principle of measurement of various scanners could restore the accuracy of measurements to the values stated by the manufacturer.

The method of solving the calibration problem is proposed to obtain a mathematical model describing the errors of discrepancy between the coordinates of the marks of the spatial polygon (the coordinates of the marks of which are known with obviously higher accuracy than they can be determined by scanning results) and the marks measured by scans.

In the article great attention is paid to practical implementation of technological schemes of calibration software products ScanIMAGER and ScanCalibr. The article gives the test result of verification method of a particular ground laser scanner, the operation result of which stopped satisfying the measurement accuracy requirements specified by the producer. The article is intended for engineering and technical workers, applying ground-based 3D laser scanning technology for solving production tasks.

Key words: 3D laser scanning, scanner calibration, spatial polygon, field distortion, ScanIMAGER, ScanCalibr.

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