CREATING METRIC SIMULATED MODEL OF A "DIGITAL TWIN" BY THE ACTIVE EARTH REMOTE SENSING METHOD

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Recently, a line of research devoted to the creation of three-dimensional metric simulated models of digital twins has been actively developing. The goal of creating digital twins is to transfer the complicated manufacturing processes, that are performed while monitoring the state of real objects, to a computer environment where a three-dimensional information model was first created. The key requirements are accuracy and efficiency within the conditions of design, construction and operation of real objects when making changes to them. These requirements are met by an active method of the Earth remote sensing, such as laser scanning. Terrestrial laser scanning is used to model objects over a relatively small area and to achieve maximum accuracy. The task of creating digital twin models poses higher requirements for choosing a field stage laser scanning technique and has many features when performing three-dimensional modeling using field data. The article proposes technique of three-dimensional modeling for creating building information models. It analyses the accuracy of the terrestrial laser scanning results. A warehouse space to be reconstructed was selected as the subject of the study. Using the example of laser scanning data for this object, it was indicated that the method under consideration allows ensuring the accuracy of creating a three-dimensional information model up to 1 cm. The laser scanning data of the object show that the considered method ensures 3D information model accuracy up to 1 cm.

Keywords: active Earth remote sensing methods, terrestrial laser scanning, 3D modelling, building information model, digital twin, simulated model

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