

AR-based 3D Digital Map Visualization Support Technology for Field Application of Smart Construction Technology

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Abstract

Recently, research on digital twins to generate digital information and manage construction in real-time using advanced technology is being conducted actively. However, in the construction industry, it is difficult to optimize and apply digital technology in real-time due to the nature of the construction industry in which information is constantly fluctuating. In addition, inaccurate information on the topography of construction projects is a major challenge for earthmoving processes. In order to ultimately improve the cost-effectiveness of construction projects, both construction quality and productivity should be addressed through efficient construction information management in large-scale earthworks projects.

Therefore, in this study, a 3D digital map-based AR site management work support system for higher efficiency and accuracy of site management was proposed by using unmanned aerial vehicles (UAV) in wide earthworks construction sites to generate point cloud data, building a 3D digital map through acquisition and analysis of on-site sensor-based information, and performing the visualization with AR at the site

By utilizing the 3D digital map-based AR site management work support system proposed in this study, information is able to be provided quickly to field managers to enable an intuitive understanding of field conditions and immediate work processing, thereby reducing field management sluggishness and limitations of traditional information exchange systems. It is expected to contribute to the improvement of productivity by overcoming factors that decrease productivity in the construction industry and the improvement of work efficiency at construction sites.

Key words: Smart Construction, Construction Management, Augmented Reality, 3D Pointcloud