



Implementation of image-based inspection technology for bridges

Young jin Choi, Jun sang Cho, Dong woo Kim

Korea University, Seoul, South Korea

Research Institute of Korea expressway corporation

Miraecity Corp.

Jung sik Kong

Korea University, Seoul, South Korea

Contact: dogplus88@korea.ac.kr

Abstract

Many infrastructures are conducting smart inspections using drones and various inspection equipment. Bridge inspections are still mostly performed by manpower, and the demand for unmanned equipment-based inspections to improve these traditional methods is increasing. In this research, a drone was used to photograph the entire view of the bridge, and rail, wire-cam were used to check the inspection blind spots that occur during inspection by personnel. A 360-degree camera was used in the part accessible to the inspector. Based on the images obtained through all technologies, a three-dimensional road view of the inspection bridge was constructed. The image-based inspection result is intuitive for both managers and inspectors, so it will improve convenience and efficiency during maintenance.

Keywords: structural health monitoring; bridge inspection; 3d image; smart inspection; wire cam.

1 Introduction

Most of the inspection of the bridge is performed by visual inspection by manpower. Visual inspection is less accurate due to problems such as when it is difficult for the inspector to access a specific area and when an inspection error occurs due to subjective judgment. In addition, the management burden for maintenance is gradually increasing due to the high cost of inputting a large number of manpower and the occurrence of excessive inspection time [1]. In order to improve this problem, the bridge inspection equipment and the inspection result in the form of a road view using the image of the equipment will be presented. The test was conducted at Geumgang Bridge in Korea.

2 Smart Utilities

Smart utility is the application of a new utility to eliminate inspection blind spots that can occur during bridge inspection, such as areas where access by field inspectors is difficult. For this inspection, representatively, Drone, Wire-Cam, and 360 degree camera were used.

2.1 Drone

Drones are already widely used for inspection and shooting in various fields. In this test, drone was used only for photographing the entire bridge. The reason is that approaching is difficult due to the vortex and GPS problem. The model used is DJI's Mavic Pro 2.