

Development of Rail Camera for Bridge inspection with Attitude Control using Thrust of Rotors

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A lot of concrete structures are deteriorating to dangerous levels throughout Japan. These concrete structures need to be inspected regularly to be sure that they are safe enough to be used. According to national standards, a visual inspection of the bridge is required once every five years. In the visual inspection, the worker check the bridge with own eyes directly. So it is necessary to set up scaffolding to access underside of bridge for visual inspection. Alternatively, it is necessary aerial work platforms. However, setting up of scaffolding and aerial work platforms are not economical in time and money. So we developed an inspection device for check of bridges called Rail camera. This inspection device connects a rod and a rail and the connection has a rotational degrees of freedom. Rotors are attached to the tip of the rod and it can be attitude controlled by thrust of rotors. So a half of the device weight is lifted by the thrust of the rotors. And it can be taken with a camera mounted on an electric slider on the rail. The worker on the bridge can check the underside of the bridge safely by holding the rod with one hand operating the rail camera with another hand. To verify the performance, the visual inspection was performed on the bridge.