

Delamination Detection Of Concrete Bridge Slab Through Uav-Based Thermal Scanning

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Delamination of concrete bridge deck due to corrosion of the rebar is a main issue influencing the serviceability and safety of the bridge infrastructure, which is time-consuming or labor-intensive to be detected using traditional methods. This study proposed an Unmanned Aerial Vehicle (UAV)-based thermal scanning method to detect the delamination with the benefits of high accuracy and efficiency. Four slabs were cast with embedded “delamination” made of plastic and polystyrene board. Thermal camera is used to capture the temperature difference during curing stage of the slabs in the lab that simulates the heating procedure induced by the solar. The delamination of the slabs is quantified using a proposed algorithm to get the contour of the temperature difference line. A UAV installed the thermal camera was used to take thermal images of the slabs outdoor after the radiation and before the dissipation of the solar heat. The delamination monitored in outdoor and indoor tests were compared. The test results indicate the proposed UAV-based method is capable to capture the delamination of the slabs with an acceptable accuracy.