

Measuring Reinforced Concrete Spacing Using Rgb Camera And Unmanned Aerial Vehicle (Uavs)

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Inspection of structures under construction is an important engineering task that needs to be done by experts to ensure that structures are built according to the specifications. Visual inspections during construction can cause errors that go unnoticed, cost money, and decrease safety. In the case of rebar inspection on large structures such as decks and frames, the inspector's safety is at risk in terms of accessing rebar manually. To address all of these challenges, different types of devices are being explored by researchers. One of these technologies is the RGB camera and LIDAR sensors. In this study, the RGB camera is programmed with an algorithm that measures the spacing between the rebar by analyzing the 3D point cloud data. 3D real-time scanning can be automatized using Unmanned Aerial vehicles (UAVs). The algorithm was tested and designed to be mounted on the drone to remotely obtain the rebar spacing. This new system promotes the use of new technologies to solve the problem of spacing measurement which helps the inspector to safely, automatically, and objectively evaluate the quality of structures without the need of manually inspecting with tape. Furthermore, the recorded measurements become a permanent record of the exact location of the rebar promoting sustainability as a resource for future effective management and maintenance. The future steps of this project contemplate UAV-real time visualization of rebar spacing values at the site.