



Structural Health Monitoring using Aerial Images taken from Unmanned Aerial Vehicle

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ABSTRACT

The objective of this study is to develop a framework that can measure the dynamics displacement and assess the condition of the structure by using commercial unmanned aerial vehicle (UAV) mounted with camera. Using images and videos for structural health monitoring (SHM) has lots of advantages over conventional wired or wireless based SHM. Not only for the advantages of installation efficiency and the low cost, videos can be used to measure dynamic displacement of the structure on multiple points, while sensors are limited to the point where it is installed. Also visual information could be used to provide more intuitive ideas about the site. While some engineers around the globe have explored monitoring of civil infrastructure with cameras, existing vision-based SHM systems cannot be immediately used together with UAVs. This study provides the framework to monitor civil-infrastructure with UAV by measuring dynamic displacements, identifying system of the structure using commercial cameras without any target, and estimating the 3D motion of the moving camera.

KEYWORDS: *Computer Vision, Structural Health Monitoring, Unmanned Aerial Vehicle, System Identification, Commercial Cameras*