Small Unmanned Aerial Systems (sUAS) for Disaster Response

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Abstract:

A crucial step in responding to destruction by natural disasters is to estimate the amount of material needed to rebuild and repair damaged infrastructure. This process can be time-consuming, expensive, and inaccurate. However, stereo imagery obtained from low-cost and commercially available small Unmanned Aerial Systems (sUAS) can be used to estimate the amount of fill needed to rebuild a roadway in a safe, inexpensive, and accurate manner. Generation of 3D point clouds from sUAS collected imagery yields data that is on par with terrestrial LiDAR sensors in terms of volumetric estimations, while the lightweight platform of a sUAS allows for rapid and repeated deployment in the immediate aftermath of a major disaster event. These characteristics, in conjunction with the capability of this platform for the remote surveying of dangerous areas, could facilitate response to a disaster in less time, with more precision, and at lower cost.