Application Methodology for the Generation of 3D Thermal Models Using UAV Photogrammety and Dual Sensors for Mining/Industrial Facilities Inspection

Authors : Javier Sedano-Cibrián, Julio Manuel de Luis-Ruiz, Rubén Pérez-Álvarez, Raúl Pereda-García, Beatriz Malagón-Picón

Abstract : Structural inspection activities are necessary to ensure the correct functioning of infrastructures. Unmanned Aerial Vehicle (UAV) techniques have become more popular than traditional techniques. Specifically, UAV Photogrammetry allows time and cost savings. The development of this technology has permitted the use of low-cost thermal sensors in UAVs. The representation of 3D thermal models with this type of equipment is in continuous evolution. The direct processing of thermal images usually leads to errors and inaccurate results. A methodology is proposed for the generation of 3D thermal models using dual sensors, which involves the application of visible Red-Blue-Green (RGB) and thermal images in parallel. Hence, the RGB images are used as the basis for the generation of the model geometry, and the thermal images are the source of the surface temperature information that is projected onto the model. Mining/industrial facilities representations that are obtained can be used for inspection activities.

Keywords : aerial thermography, data processing, drone, low-cost, point cloud

Conference Title : ICPA 2022 : International Conference on Photogrammetry and Applications

Conference Location : Istanbul, Türkiye

Conference Dates : July 28-29, 2022