An Uncertainty-Aware Multi-View Approach To Automated Post-Disaster Damage Assessment

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This study aims to advance towards more reliable, automated post-disaster assessment of damages in buildings. The current practice in automated post-disaster damage assessment do not generally quantify the damage levels of the affected buildings and are restricted to qualitative damage identification. To overcome these limitations, we propose a Multi-View Convolution Neural Network (MV-CNN) model that is based on comprehensive visual damage data in the form of multiple ground and aerial views of the damaged buildings. The model combines the information from different views, resulting in 3-dimensional (3D) aggregation of the 2D damage features from each view. This spatial 3D context damage information will result in more accurate quantification of damage levels. In addition, the involved model uncertainties are accounted by using dropout as a proxy for Bayesian approximation. The outcome of this study is sought to enhance the content and predictions obtained from such automated models.