

Automated Building Damage Assessment Using Remote-Sensing Imagery

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The automated comparison of before-and-after remote-sensing imagery provides an effective means for rapid and widespread assessment of windstorm damage to individual buildings. The development of automated damage-assessment algorithms involves the classification of building damage signatures from a remote-sensing perspective, the identification of corresponding temporal change metrics, and the correlation of remote-sensing change signatures with actual field-based damage observations.

Hurricanes Charley and Ivan marked the first major hurricanes for which high-resolution satellite images were available. These storms provided an exceptional set of before-and-after images. Investigators from Texas Tech University and ImageCat, Inc. obtained temporal satellite image sequences and performed associated ground-truthing damage surveys for these major hurricanes. This paper chronicles the use of the before-and-after hurricane imagery to develop remote-sensing-based damage scales for various building inventories; the correlation of remote-sensing damage metrics with field-based damage investigations; and the progress in automated damage assessment using temporal image sequences.