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## Landslide Identification in UAV Images Through Recognition of Landslide Boundaries and Ground Surface Cracks

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Landslides represent one of the most pervasive and detrimental geohazards worldwide. Precise detection of potential landslides is imperative for effective landslide risk management. While the utilization of Unmanned Aerial Vehicles (UAVs) has seen a recent surge in landslide evaluation, the majority of contemporary UAV image-based identifications predominantly depend on visual inspections. This study introduces a sophisticated image analysis framework tailored for landslide identification in UAV-captured imagery. This framework not only discerns landslide boundaries but also detects ground surface fractures. Employing an object-oriented image analysis approach, potential landslide boundaries within UAV images are identified. Concurrently, an automated model, refined through a deep transfer learning methodology, recognizes ground surface fractures in these images. Subsequent to this, a fusion of identified landslide boundaries and ground fractures is achieved through Boolean operations, facilitating nuanced landslide detection within UAV imagery. To underscore the proficiency of our proposed framework, we selected the Heifangtai Terrace in Gansu, China, as a case study. The resultant identifications are cross-referenced with field survey data to confirm the validity.