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# Aerial Image Similarity Estimation Using Cloud Removal Methods

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Unmanned aerial vehicles (UAVs) are used in farming, traffic control, police operations. One of the challenges UAVs faces is the loss of GPS signal. To combat the problem, aerial vehicles use built-In sensors and cameras to help navigate and calculate flight trajectory. This article (research) discusses a map-based approach for aerial vehicle localization: images taken by onboard cameras during flight are compared to an aerial map to find similarities between them. However, the accuracy of a map-based approach decreases during cloudy weather conditions. Cloud coverage is considered a significant loss of information. It can become an obstacle when comparing satellite imagery and lead to deviation in flight trajectory. Removing clouds using neural networks and generative image inpainting algorithms can increase the amount of information found in aerial images. Modern techniques require additional data such as multispectral satellite imagery or cloud-free pictures taken over different time intervals to fill in cloudy image areas. This article introduces a method capable of cloud detection and removal using only RGB bands. Various experiments based on convolutional neural networks and the triplet loss function were conducted to prove the effectiveness of cloud removal methods in aerial image similarity tasks. After testing numerous network configurations results demonstrate that aerial images with cloud removal algorithm applied to them outperform original cloudy images.