Application of Histogram of Oriented Gradient in Person Detection from Aerial Images

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Abstract: With the steady increase in the frequency of occurrences and intensity of natural calamities in recent years, the use of technology for disaster prevention and mitigation is becoming more prominent. Aerial surveillance is one way of monitoring the progression of events in disaster-stricken areas, one important aspect of which is conducting a search for survivors who are in immediate need of rescue and relief. Computer vision algorithms can be used to aid in the detection, recognition, and tracking of humans in aerial videos recorded using unmanned aerial vehicles (UAVs). In this paper, Histogram of Oriented Gradients (HOG) is used for the human detection algorithm. This technique uses feature descriptors that generalize objects under different conditions (i.e. perspective, pose and illumination), in order to make the classification task easier. A Support Vector Machine (SVM) is employed for the image classification task. The developed system's performance is presented using confusion matrix, recall, precision, and F-score metrics.

Key Words: HOG; SVM; person detection; aerial images; image processing