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Airplane Detection Using Deep Learning Based on VGG and SVM

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Abstract: Object detection is widely utilized in many applications, such as airport surveillance, prevention of potential collisions, aid in airspace management, and enhancing overall aviation safety. This paper proposes an algorithm for airplane detection regardless of the airplane's model, type, or color variations. The main challenges in automatic airplane detection tasks could be the differences in scale, the orientation of the airplanes, and similarity with other objects. Therefore, an airplane detection system must be designed to achieve good discrimination without the influence of airplane rotation, pose, or resolution. Object detection can be performed by considering three major phases, i.e., feature extraction, detection of an airplane, and evaluation of the airplane. To extract the plane region, a deep feature extraction method is used with the VGG model. The plane is detected using the SVM. Two datasets were used to evaluate the designed system's effectiveness. The results achieved a 99% F score using the Caltech-101 dataset and 98% for the FGVC-aircraft dataset.