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OBSTACLE AVOIDANCE SYSTEM USING A MONOCULAR CAMERA FOR A LOW ORBIT SPACECRAFT USING BRUTE FORCE K-NEAREST NEIGHBOR (KNN) ALGORITHMS

Abstract

One of the key challenges for a low orbit spacecraft is to avoid collision with space debris. The proposed research work to find an obstacle avoidance system using a monocular camera for a low orbit spacecraft. As the obstacle comes closer to the spacecraft, the height of the obstacle increases. It can be used to estimate the depth of the obstacle. To extract and match the features of the previous frame and the current frame ORB key points can be used for detecting features, and brute force K-nearest neighbor (KNN) algorithms can be used for matching the features of the two frames. Finally, with help of this information, a control command can be given to the spacecraft to destroy the debris that is approaching it, at specified distance.