



Aerial View Rock Obstruction Warning System (AVROWS)

Patrick V. Atienza¹, Hans L. Lim¹, Patrick T. Lo¹, Jan M. Mercadejas¹, and Macario O. Cordel¹

¹ *Center for Automation Research, College of Computer Studies, DLSU – Manila*
patrick_atienza@dlsu.ph, hans_lim@dlsu.ph, patrick_t_lo@dlsu.ph, jan_mercadejas@dlsu.ph

Abstract: Being able to differentiate and quantify different objects from their surroundings is one important application of image processing that has great uses in multiple fields. One such example is in the field of helicopter automation, where distinguishing potential obstructions from their surroundings is instrumental in autonomous systems. This is because helicopters, as with all forms of aircraft, are very demanding when it comes to their landing surface, where even a few slight obstructions could prevent proper landing and even cause accidents. Moreover, because traditional sensors cannot fully analyze the environment in this manner, the use of image processing is required. This paper presents a similar concept explored by designing a system that is capable of identifying rocks on the grass from a video feed obtained through a simulated aerial view. One of the problem with processing video feed from a helicopter is that the video tends to be shaky resulting in blurred video frames. Although deblurring algorithm can be used to remove the blur in each video frame, we were able to see however that blurring the image aids in minimizing noises obtained from grass edges because the blurred image smoothens out the grass edges, while still keeping intact the rock edges, thus improving the accuracy of rock segmentation. Although this kind of object detection and segregation can prove to be quite a challenge, especially due to the noise brought to about by background. This is because if there is not sufficient contrast between the background and the object to be detected, the system will no longer be able to properly distinguish the object. If a rock is identified, a notification will be prompted by the system notifying that landing for that particular area is not safe.

Key Words: Landing; Stone Segmentation; Object Detection; Autonomous Helicopter