Abstract

Head up Display (HUD) is a means of presenting information to the pilot key flight instrument data onto a set of glasses regarded as 'beam combiner' positioned just in front of the pilot's line of sight looking ahead out of the aircraft helping him in key tasks like take off, navigation and landing. It also improves the situational awareness greatly by displaying flight, sensor and instrument data in the pilot's forward field of view. HUD employs a CCD camera mounted right in front of the pilot, that is, between the beam combiner and the pilot for recording the view comprising of the outside world and the HUD symbology as seen by the pilot. This recorded video is sent directly through telemetry to the flight analysis ground station for real time flight data analysis as seen by the pilot as well as to guide the pilot. The recorded video is also used for post flight analysis as well as video source for HUD repeater display used by the pilot occupying rear cockpit seat in case of trainer aircrafts. The inconsistent and improper lighting conditions prevailing during weather conditions such as rain, snow, fog, bright sunny daylight and against the white clouds causes either insufficient or excessive light intensity at different spatial locations falling on the CCD camera sensor head resulting in degraded image quality with very low contrast. The work presented in this paper
Template Matching to Enhance HUD Colour Images

attempts to tackle this problem through theoretical study and experimental analysis. A customized template matching technique is also presented here for enhancement of the video captured by HUD camera. Added to this, hardware based methods are also suggested which can be employed for real time video enhancement.

References

- Marconi, U. S. Patent 4,261,647 (1981), Head Up Displays

Index Terms

Computer Science

Pattern Recognition
Keywords
Head Up Display  Ccd Imaging  Simultaneous Contrast  Image Segmentation  Template Matching