A NEW METHOD FOR SUPPRESSING OPTICAL TURBULENCE IN VIDEO (TueAmOR9)

Author(s) :

Dalong Li (Georgia Institute of Technology, United States)
Russell M. Mersereau (Georgia Institute of Technology, United States)
David H. Frakes (Georgia Institute of Technology, United States)
Mark J. T. Smith (Purdue University, United States)

Abstract :

The presence of optical turbulence in video acquired by cameras viewing scenes at long distances can contribute significantly to degradation. This problem arises routinely, for example, in astronomy where objects of interest reside beyond the earth's atmosphere. Optical turbulence introduces time−varying perturbations in the images as well as blurring. In this paper, we introduce a method for suppressing the effects of this turbulence to enhance the quality of the observed objects and scenes. The method proposed is based on a new form of adaptive control grid interpolation in which computed motion vectors are used as the basis for turbulence estimation and suppression. In particular, the quasi−periodicities of the turbulent motion are exploited in the algorithm, which allow them to be suppressed while true motion (such as panning and zooming) is preserved.

Menu