Adaptive Prediction based Diamond Search Algorithm (APDS) for Video Encoder of Solar Powered UAV

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Abstract

Unmanned Aerial Vehicle (UAV) provide bird’s eye view over an intersection or a large area, and provide real-time surveillance of area under observation. UAVs have been playing a vital role in disaster management due to the increased sensing and processing capabilities. This paper proposes a fast adaptive prediction based diamond search Motion Estimation (ME) algorithm for Sun Falcon 2, a solar powered UAV’s video encoder to cope the computational complexity, low power and increased quality of ME process requirement. Results show that the proposed Adaptive Predict Diamond Search (APDS) ME algorithm performs best in the term of PSNR, MSE and number of Search Points (SP), for approximately all the video sequences. Moreover, performance of APDS is decreased a little bit in term of number of SP when compared to Hexagon search algorithm but its PSNR is still considerably high for those video sequences. The average PSNR improvement rate of APDS is 0.62, 2.67, 0.82, 0.83 and 2.31 for Diamond Search (DS), HexBS, FHS, FSS and MDS respectively, while the average SIR is 25.4404, 6.3374, 48.274 and 205.55 for DS, FHS, FSS and MDS respectively.
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Index Terms

Computer Science  Algorithms

Keywords

Motion estimation, Motion vector, MBD, UAV, DS, FHS, MDS, HexBS