A Novel Approach for Super Resolution of Video Frame using Spatially Adaptive Total Variation

International Journal of Computer Applications
Foundation of Computer Science (FCS), NY, USA

Volume 176
Number 4

Year of Publication: 2017

Authors:
Vinod Kumar Banse, Kamlesh Chandravanshi

10.5120/ijca2017915575
10.5120/ijca2017915575.bib

Abstract

Super resolution (SR) for real-life video sequences is a challenging problem due to complex nature of the motion fields. In this paper, a novel blind SR method is proposed to improve the spatial resolution of video sequences, while the overall point spread function of the imaging system, motion fields, and noise statistics are unknown. The high-resolution frames are estimated using a cost function that has the fidelity and regularization terms of type Huber–Markov random field to preserve edges and fine details. The fidelity term is adaptively weighted at each iteration using a masking operation to suppress artifacts due to inaccurate motions. Very promising results are obtained for real-life videos containing detailed structures, complex motions, fast-moving objects, deformable regions, or severe brightness changes. The proposed method outperforms the state of the art in all performed experiments through both subjective and objective evaluations.

References


Index Terms

Computer Science

Signal Processing
Keywords

Video super resolution, blur de-convolution, blind estimation, Huber Markov random field (HMRF).