

GSAIM Seminar

(The four minute a Day Seminar Series)

"Single Image Super-Resolution Based on Parameter Estimation"

by

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Abstract

Although most applications using digital images require higher resolution images, it is not easy to get the higher resolution version because it needs high cost in case of using advanced hardware. Therefore, the super resolution technique tries to solve the problem through software with low cost and became one of the most major image processing fields.

The one of the most important problems of the super resolution technique is known that the exact high resolution image is never known. In other words, the super resolution technique is ill-posed. In order to solve the ill-posed problem, Glasner et al. used patch recurrences within and across scales using a single input image. Yang et al. used sparse representation to construct dictionary through training.

We propose a fast and effective self-guided super resolution algorithm based on parameter estimation between an input image and its lower resolution one. The basic idea of the proposed algorithm is to use estimated properties of the unknown high resolution image from its low resolution versions. Although proposed method shows little lower image quality compared to Yang's one in big edge regions, we could confirm that the proposed algorithm shows similar or better enhancement result in high frequency regions. Besides, the proposed method is not only much faster than Yang's one (466.11 \rightarrow 1.27 seconds in our system) but also able to be implemented in hardware such as digital TV.

Our method will focus on enhancement control near big edge regions since the results shows some artifacts near big edge regions.