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# Video Super-Resolution Using an Adaptive Superpixel-Guided Auto-Regressive Model

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## Abstract

This paper proposes a video super-resolution method based on an adaptive superpixel-guided auto-regressive (AR) model. Key-frames are automatically selected and super-resolved by a sparse regression method. Non-key-frames are super-resolved by exploiting the spatio-temporal correlations: the temporal correlation is exploited by an optical flow method while the spatial correlation is modeled by a superpixel-guided AR model. Experimental results show that the proposed method outperforms state-of-the-art methods in terms of both subjective visual quality and objective peak signal-to-noise ratio (PSNR). The proposed method requires less computation and is suitable for practical applications.

*Keywords:*

Video super-resolution, superpixel, auto-regressive model, spatio-temporal correlation.

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## 1. Introduction

Video super-resolution is a classic and hot issue in computer vision and video processing, which can be classified into three categories: 1) super-

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