

Abstract Details

Title: Basic Image Compression Algorithm and Introduction to JPEG Standard

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Abstract: Because of the explosively increasing information of image and video in various storage devices and Internet, the image and video compression technique becomes more and more important. This paper introduces the basic concept of data compression which is applied to modern image and video compression techniques such as JPEG, MPEG, MPEG-4 and so on. The basic idea of data compression is to reduce the data correlation. By applying Discrete Cosine Transform (DCT), the data in time (spatial) domain can be transformed into frequency domain. Because of the less sensitivity of human vision in higher frequency, we can compress the image or video data by suppressing its high frequency components but do no change to our eye. Moving pictures such as video are data in three-dimensional space consists of spatial plane and time axis. Therefore, in addition to reducing spatial correlation, we need to reduce the time correlation. We introduce a method called Motion Estimation (ME). In this method, we find similar part of image in previous or future frames. Then replace the image by a Motion Vector (MV) in order to reduce time correlation. In this paper, we also introduce JPEG standard and MPEG standard which are the well-known image and video compression standard, respectively.

Keywords: MPEG, MPEG, DCT, correlation, compression, ME, MV.