COLOR IMAGE CODING USING REGIONAL CORRELATION OF PRIMARY COLORS

Yalon Roterman and Moshe Porat

Department of Electrical Engineering
Technion – Israel Institute of Technology
Haifa 32000, Israel

Abstract

Most color compression systems reduce the redundancies between the RGB color components by transforming the color primaries into a decorrelated color space, such as YIQ or YUV. In this paper a different compression approach is proposed. Since the high correlation of the RGB color channels implicitly suggests a localized functional relation between the components, it is used here in an alternative framework, by approximating subordinate colors as functions of a base color. This way, only a reduced number of parameters is required for coding the color information. Furthermore, since this correlation is in particular high locally, the image is first sub-divided into regions. For each region the correlation is analyzed and exploited separately. The size of the encoded regions is gradually reduced to allow progressively a more refined description of the transmitted image. Compression results of this progressive approach, which could be useful for slower communication channels, are presented, and compared with JPEG as a typical example of the decorrelation approach. Our conclusion is that the proposed new approach to progressive image coding could be superior to presently available compression techniques.

Corresponding author:
Moshe Porat,
Dept. of Electrical Engineering,
Technion, Haifa 32000, Israel.
Email: mp@ee.technion.ac.il
Fax: +972-4-829-5757
Tel.: +972-4-829-4684