

Abstract

Human Visual System plays an important factor in image processing. However, based on geometric optics, we found our eyes are not a perfect optical system. The Region of Sharp Area is very small. Therefore, it would be wasteful to design a system with perfect image rendering techniques of which the eye could not utilize.

Based on this observation, we introduce three kinds of applications. First, we investigated a “Region Of Sharp Area” render, with this scheme, we have successfully speeded up the 3D scenes generation. Secondly, we proposed a “Multiple Resolution Image Compression” algorithm, with this method, we have successfully improved the image compression ratio. Thirdly, we develop a fast image resizing scheme that produces significantly improved quality over the pixel replication method. This algorithm is suitable for real-time image resizing applications including: Virtual Reality, Optical Character Recognition, Symbol Recognition, and Car License Plate Recognition. Although this method produced “jaggies” at the edges in the resized image, the execution time is about 22 to 40 times fast than a similar function provided by MS Windows and the Weiman scheme. This scheme doesn’t use floating-point operations nor buffer area. The schemes is suitable for image viewer based on embedded system, such as Personal Digital Assistant.