IMAGE APPROXIMATION USING TRIANGULATION

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ABSTRACT

An image is a set of quantized intensity values that are sampled at a finite set of sample points on a two-dimensional plane. Images are crucial to many application areas, such as computer graphics and pattern recognition, because they discretely represent the information that the human eyes interpret. This thesis considers the use of triangular meshes for approximating intensity images. With the help of the wavelet-based analysis, triangular meshes can be efficiently constructed to approximate the image data. In this thesis, this study will focus on local image enhancement and mesh simplification operations, which try to minimize the total error of the reconstructed image as well as the number of triangles used to represent the image. The study will also present an optimal procedure for selecting triangle types used to represent the intensity image. Besides its applications to image and video compression, this triangular representation is potentially very useful for data storage and retrieval, and for processing such as image segmentation and object recognition.