

An algorithm for lossless compression of voxel data using quadtrees

In the talk a novel algorithm for lossless compression of voxel data will be presented. The algorithm is based on analysis of slices of voxel data and uses quadtrees to encode these slices. The algorithm can efficiently determine homogeneous areas in voxel datasets and exploits data coherence of voxel data for efficient compression. We introduce several various approaches for determination of coherence and similarities between the slices, as well as some new entropy encoding techniques. Developed algorithm has two significant properties. Firstly, it is designed for lossless compression of volumetric data, which is not the case with most of existing algorithms however this is a very important feature in some fields, i.e. medicine. Secondly, the algorithm supports progressive reconstruction of volumetric data and is therefore appropriate for visualization of compressed volumetric datasets over the internet.