Main goal of the thesis was to research or propose a suitable method for substitution of volume data including volume data derived from motion pictures by irregular tetrahedron-based grids. The method should minimize the loss of information and the size of the data. The thesis proposes a method for finding a suitable tetrahedron grid that substitutes the volume data without assuming anything about its inner structure. The proposed method can be applied on both volume data and volume data from motion pictures. The method consists of two steps. First a basic grid is generated by a simple incremental algorithm and then it is improved by a process of simulated annealing. The thesis proposes an unbiased measure for measuring the loss of information and evaluates the suitability of the proposed method for both types of data based on experiments. The thesis includes an implementation of the proposed method which demonstrates its use. The thesis also includes sample volume data and motion picture volume data which were used to test the suitability of the method.