Medical diagnostics using computed tomography or magnetic resonance is a common part of complex medical checkup for a long time. These devices produce vast volumes of data, which must be analyzed by an expert physician. There is a big space for utilising computers to aid medical diagnosis, or visualization. This work aims to measure volume of a specific organ in the human body, like kidneys or spleen. To measure volume of the organ it is necessary to reconstruct the object from three-dimensional data. Reconstruction is based on segmentation of the image data, which separates reconstructed organs from the background. The task of segmentation is specially adapted to this kind of data, which are, from specimen
to specimen, characterized by big similarity in common shape, but also by big heterogeneity in tiny details. Deformable models were chosen as a primary tool for the segmentation of three-dimensional volumes. They are also the main topic of this work. Programs measuring volume in medical data exist, but thanks to increasing performance of modern computers it is possible to implement new algorithms, which are not present in today's software tools. The result of this work is a system which segments and measures volume in medical data. We also perform benchmarks, which expose an error of the measurement with respect to ground truth.