**THREE-DIMENSIONAL HEART MODEL VISUALISATION BASED ON MEDICAL IMAGING**

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Statistically, cardiovascular diseases are among the most common diseases in developed countries being the most common cause of death in more than 50% of cases. Minimally invasive diagnostic methods for the diagnosis of heart diseases are Computed Tomography (CT) and Nuclear Magnetic Resonance (NMR). In the resulting image, which may be 2D or 3D, internal structure features, e.g. size, shape, density, defects, etc. are well visible. The acquired medical data are organized as a group of cross sections and require visualization. Sophisticated visualization methods provide an insight into the complex behaviour of the heart. Furthermore, they provide localized view of the selected areas within the heart and enable interactive changes to the parts of interest. The goal is to construct a 3D model of the heart based on the 4D CT images of the heart as well as to construct a 3D model of the heart based on the 4D NMR images of the heart. From the resulting 3D model of the heart, a further analysis and modelling of the heart in every stage of the cardiac cycle can be done. The expected result is the video simulation of the heart that can afterwards be upgraded for the purpose of determining the specific properties of the heart and its motion. For the quantitative results analysis and successful 3D heart modelling, MATLAB software package will be used. The software package MATLAB displays all data in the form of matrices, thus being the excellent tool for the results verification. In addition, MATLAB allows graphic manipulations in both 2D and 3D space. Consequently, dangerous cardiovascular diseases will be much easier detected and analysed because modern CT and NMR devices produce more complex and larger data sets which creates the need for efficient and more advanced visualization algorithms.