

BRONCHIAL TREE MODELING ALGORITHMS

Summary - The article presents a new conception of 3D human bronchial tree model which is useful to test algorithms for quantitative analysis of bronchial tubes based on tomographic images. The proposed model has been developed as an extension of the algorithm to generate the human bronchial tree by Hiroko Kitaoka, Ryuji Takaki and Bela Suki, The new model has been extended with geometrical deformations of branches and procedure which iteratively add noise and smooth a tree in voxel space. The presented conception has been implemented in the form of computer algorithms which generate 3D images of bronchial trees in voxel space. The article presents results of the implemented algorithms which are more like the segmented, real, bronchial trees than model Kitaoka, Takaki and Suki. Moreover the authors present influence of the algorithm parameters on the results and usefulness of the generated models for testing procedures of quantitative analysis of bronchial trees.