

CRANIAL BONES THREE DIMENSIONAL MODELS EMBEDDED IN COMPUTARIZED TOMOGRAPHY SECTIONS

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The possibility to carry out tridimensional reconstructions of anatomic structures through computing procedures, and which are taken from radiological sections of patients who need an examination, mean a relevant change to the visualization, understanding, and planning the study of the human body, which, no doubt, will entail as well as an improvement in the teaching and learning resources, and thus help attain a better quality teaching.

The aims of this study are: 1) to present a computing tool for the three-dimensional (3D) visualization of skull bones, together with its different spatial relations; 2) to provide users with an attractive and dynamic teaching or training resource for the study of cranium bone structures.

Images were taken and processed using a computed tomography tool, departing from Digital Imaging and Communications in Medicine (DICOM) files. A manual labelling process was carried out using a 3D editor and using different colour codes. From each of the anatomical sections of interest, a surface model was developed, conformed by a triangular mesh which was obtained by means of marching cubes algorithm. The creation of a viewer, programmed with Visual C+, allowed the representation of scenes in any spatial orientation and store those in bitmap format. Our computing tool constitutes an excellent iconographic archive of anatomical images of skull bones in three dimensions, embedded in computerized tomography sections which allowed both a complete assessment of the whole morphological integrity, and a better analysis of the vicinity relations that they hold.

Visualization of anatomical structures in tridimensional format will boost their study and understanding, obtaining a more realistic image than those got from traditional materials of anatomical structures such as pictures, books, atlas or charts. The volumetric generation of structures and 3D visualization imply an active learning process.

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