Computed tomography image reconstruction in 3D voxelspace

ABSTRACT

The aim of the study was to investigate the relationship between 2D gray scale pixels and 3D gray scale pixels of image reconstructions in computed tomography (CT). The 3D space image reconstruction from data projection was a challenging and difficult research problem. The image was normally reconstructed from the 2D data from CT data projection. In this descriptive study, a synthetics 3D Shepp-Logan phantom was used to simulate the actual data projection from a CT scanner. Real-time data projection of a human abdomen was also included in this study. Additionally, the Graphical User Interface (GUI) for the application was designed using Matlab Graphical User Interface Development Environment (GUIDE). The application was able to reconstruct 2D and 3D images in their respective spaces successfully.The image reconstruction for CT in 3D space was analyzedalong with 2D space in order to show their relationships and shared properties for the purpose of constructing these images.

Keyword: Computed tomography; DICOM; Image reconstruction; Pixels; Voxels