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人脑深部核团三维模型的构建与数据测量(PDF) 分享到

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Title: Three-dimensional reconstruction and measurement of human deep brain nuclei

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关键词: [脑深部核团](#); [中国可视人](#); [三维重建](#); [测量](#)

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摘要: 目的 构建大脑深部核团三维可视化模型, 以对其立体形态和空间位置进行研究。
方法 选取可视人体数据集头部连续横断位图像, 将其重采样到平行前后连合平面方向后, 逐张分割出其中的脑深部核团及前后连合等结构的二维轮廓; 采用面绘制和体绘制对各分割结构进行三维重建和虚拟显示, 并根据重建模型测量计算各核团在大脑空间坐标系中的位置范围、重心点坐标和体积。
结果 获得了平行于前后连合平面的头部连续断面真彩色图像集和附有解剖学标识的脑深部核团二维轮廓分割图像集, 重构了各核团的面绘制和体绘制三维模型, 并获得其在前后连合中点为原点的大脑空间坐标系中的核团重心点坐标, 核团在X、Y、Z轴上的投影范围和核团体积等解剖数值。
结论 基于可视人体数据集所构建的脑深部核团三维可视化模型充分显示了各核团在大脑中的立体形态和空间位置关系, 并提供了核团重心点坐标、范围、体积等解剖数值。

Abstract: Objective To study three-dimensional morphology and spatial location of human deep brain nuclei. Methods Cross-sectional head images of Chinese Visible Human II (CVH-2) were selected and adjusted to a certain angle to meet anterior commissure (AC) and posterior commissure (PC) axial plane. The

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locations and outlines of deep brain nuclei were tracked in transversal, sagittal and coronal images continuously, and then the cross-sectional images as well as related structures were segmented by image processing software. Surface rendering and volume rendering were used to reconstruct nuclei and related structures. Meanwhile, the anatomical data of deep brain nuclei, such as spatial range, coordinate value of gravity center and volume, were measured and calculated.

Results The true-color cross-sectional head images that paralleled to AC-PC axial plane were obtained, and the outlines of deep brain nuclei in cross-sectional head images were segmented. Three-dimensional visible models of nuclei in deep brain were reconstructed, and the anatomical data such as coordinates of the gravity center, coordinate ranges and nuclear volume were acquired.

Conclusion The reconstructed three-dimensional model based on CVH-2 not only displays the three-dimensional morphology and spatial relationship of human deep brain nuclei, but also provides the anatomical data of the nuclei.

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