Hybrid ROI-based visualization of medical models

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Handling three-dimensional information during the remote visualization of medical images in tele-medicine requires efficient systems to achieve fast data transmission and interactive visualization. Client-server architectures meet these functionalities. The use of mobile devices is sometimes required due to the portability and easy maintenance, but issues like transmission time for the volumetric information and low performance hardware properties must be addressed. We present a hybrid visualization approach which is based on two transfer-function aware models. Given a user defined region of interest (ROI), the client stores a low resolution wavelet-based model of the volume data, and a ROI-dependent high resolution model based on gradient-octrees. This last model is only sent to the client when the ROI is changed. Interaction in the client is autonomous (without any data transmission) while the ROI is inspected. The results show that our hybrid approach is compact, efficient and scalable, with compression rates that decrease when the size of the volume model increases.