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Gradient Octrees: A new scheme for remote interactive exploration of volume models

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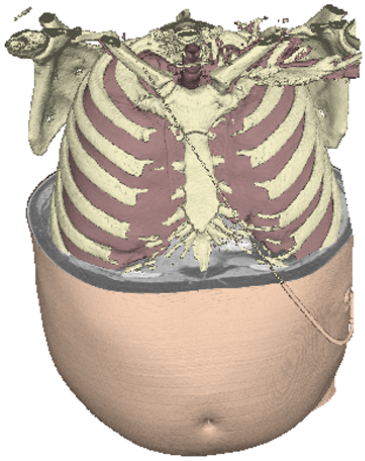

Remote exploration of medical volume models is nowadays a challenging problem. Interactive visualization algorithms must be able to send and render in real-time the volume model at the maximum possible visual quality, while adapting to network bandwidth limitations and to hardware constraints in the client device. In this paper we present a transfer function-aware scheme for the remote interactive inspection of volume models in client-server architectures with the objectives of supporting multi-resolution, avoiding gradient computations in the client device and sending a very limited amount of information through the network. Gradient Octrees can be progressively transmitted to the clients in a strongly compact way while achieving a minimum loss of visual quality as compared to state of the art ray-casting renderings. Visual volume understanding can be complemented by showing 2D sections of the original volume data on demand.

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