Surfel Octrees: A New Scheme for Interactive Inspection of Anatomy Atlases in Client-Server Applications

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Nowadays, an increasing interest on tele-medicine and tele-diagnostic solutions can be observed, with client/server architectures for remote inspection of volume image-based medical data which are becoming more and more popular. The use of portable devices is gradually spreading due to their portability and easy maintenance. In this paper, we present an efficient data model for segmented volume models based on a hierarchical data structure of surfels per anatomical structure. Surfel Octrees are compact enough for transmission through networks with limited bandwidth, and provide good visual quality in the client devices at a limited footprint. Anatomy atlases are represented as octree forests, supporting local interaction in the client device and selection of groups of medical organs. After presenting the octree generation and interaction algorithms, we present several examples and discuss the interest of the proposed approach in low-end devices such as mobiles and tablets.

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