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Interactive visualization of medical volume models in mobile devices

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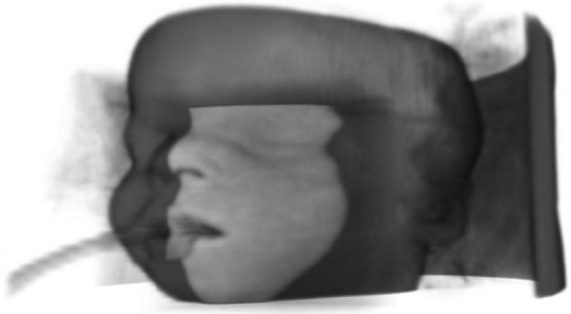

Interactive visualization of volume models in standard mobile devices is a challenging present problem with increasing interest from new application fields like telemedicine. The complexity of present volume models in medical applications is continuously increasing, therefore increasing the gap between the available models and the rendering capabilities in low-end mobile clients. New and efficient rendering algorithms and interaction paradigms are required for these small platforms. In this paper, we propose a transfer function-aware compression and interaction scheme, for client-server architectures with visualization on standard mobile devices. The scheme is block-based, supporting adaptive ray-casting in the client. Our two-level ray-casting allows focusing on small details on targeted regions while keeping bounded memory requirements in the GPU of the client. Our approach includes a transfer function-aware compression scheme based on a local wavelet transformation, together with a bricking scheme that supports interactive inspection and levels of detail in the mobile device client. We also use a quantization technique that takes into account a perceptive metrics of the visual error. Our results show that we can have full interaction with high compression rates and with transmitted model sizes that can be of the order of a single photographic image.

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