

AbstractID: 1586 Title: Removal of bone in CT Angiography of the cranial and cervical arteries by Piecewise Matched Mask Bone Elimination

To fully comprehend the complex geometry of a vascular structure, CT Angiography (CTA) data sets are often visualized by making maximum intensity projection (MIP) images. The voxels that represent bone and obscure the vascular structures have to be removed from the data set, prior to the generation of the MIP image. An additional scan made prior to the injection of contrast agent is used to identify the bone unambiguously. Due to inevitable movements of the patient, the CTA data set and the additional data set have to be registered. A new registration scheme was developed in order to register and mask bones that can move with respect to each other (piecewise matched mask bone elimination (MMBE)). Furthermore a phantom study was performed to evaluate and quantify the trade-off between the removal of the bone and the preservation of the arteries contiguous to the bone. It appeared that when masking the bone an additional strip of soft tissue of approximately 1 mm wide is also masked. This is acceptable for the relatively large arteries in the region of interest. The mAs value of the additional scan could be lowered to one quarter of the mAs value of the CTA scan. We conclude that when using our improved, piecewise MMBE method it is feasible to obtain MIP images of the cervical and cranial arteries free from overprojecting bone in a fully automatic way and with only a slight increase of the total radiation dose.

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