

RING AND STREAK ARTIFACT REMOVAL IN CT

In X-ray Computerized Tomography (CT), ring artifacts are caused by imperfect detector elements as well as by defects or impurities on the scintillator crystals. They appear on CT images as a number of dark concentric rings superimposed on the structures being scanned. Post processing such as noise reduction, binarization, or segmentation of image information is significantly complicated by presence of such artifacts. This project proposes an efficient, fast, powerful and stable improved hybrid algorithm in the polar domain for eliminating the ring artifacts. This algorithm provides tight condensation of artifacts and hence preserves all the structure information in the image with reduced computational complexity. The results show that the superiority of new algorithm comparing with the existing techniques.

The streak artifacts caused by metal implants degrade the image quality and limit the applications of CT imaging. The standard method used to reduce these metallic artifacts often consists of interpolating the missing projection data but the result is often a loss of image quality with additional artifacts in the whole image. Project propose a new strategy based on a three stage process: the application of large scale non local means filter (LS-NLM) to suppress the noise and enhance the original CT image, the segmentation of metal artifacts and metallic objects using a region growing algorithm, a modified exemplar based in painting technique to restore the corrupted projection data in sinogram. The final corrected image is then obtained by merging the segmented metallic object image with the filtered back projection (FBP) reconstructed image from the in printed sonogram.