

## Ring artifacts removal from CT image slice using CNN and RNN net

*Saturday, 24 August 2019 16:20 (15 minutes)*

CT image ring artifacts are caused by the unsatisfactory response of detector pixels, which degrades the reconstructed image and affects the subsequent processing and quantitative analysis of the image. A novel algorithm based on deep learning is proposed to correct CT ring artifacts. The proposed correction procedure includes the following steps: (1) transform the training reconstructed images into polar coordinates; (2) separate the transformed training images to two parts, near and far from the center; (3) train the two parts separately by the proposed deep learning net to achieve the weights and bias; (4) transform the test reconstructed CT images into polar coordinates; (5) separate the transformed test image to two parts, near and far from the center; (6) input the two parts to the trained network and obtain two outputs; (7) merge the two outputs to one data; (8) transform the merged data back to Cartesian coordinates to restore the CT image slice with reduced ring artifacts. This approach has been successfully used on the CT data with simulated ring artifacts and the real data.

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**Session Classification:** Poster Session by Young Scientists