Dominik Vágner # - METAL ARTIFACTS REDUCTION IN DENTAL CT SCANS

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1. OBJECTIVE

Reduce artifacts ("noise")
caused by the presence of metals
Retaining the metals themselves.



Fig. 1 - Metal Affected Input

2. GENERATED SYNTHETIC DATASET

- Naturally impossible to obtain dataset.

- Systematically generated real-like synthetic dataset based on prior teeth segmentation.

(CT Scans provided by TESCAN 3DIM)





Output

Fig. 3 - Dataset Creation Process

🗱 Neural Network



Fig. 2 - Ideal Ouput

3. NETWORK ARCHITECTURE



Fig. 4 - U-net-like Network Architecture

4. RESULTS

- Performance measured by evaluation metrics.
 Pesults on our generated dataset:
- Results on our generated dataset:

PSNR (dB)SSIMProposed Architecture50.820.9873

Fig. 5 - Synthetic Dataset Results

Comparison against state-of-the-art method.On a public subset of their dataset:



	PSNR (dB)	SSIM
Proposed Architecture	43.93	0.9824
InDuDoNet [1]	41.48	0.9904

Fig. 6 - Comparison Results

3D Result

Slice Results

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[1] Wang, H., Li, Y., Zhang, H., Chen, J., Ma, K., Meng, D., Zheng, Y., 2021b. InDuDoNet: An interpretable dual domain network for CT metal artifact reduction, in: International Conference on Medical Image Computing and Computer Assisted Intervention, Springer. pp. 107–118.