

# METAL ARTIFACTS REDUCTION IN DENTAL CT SCANS

supervisor: Ing. Michal Španěl Ph.D.

consultant: Ing. Oldřich Kodým Ph.D.

## 1. OBJECTIVE

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

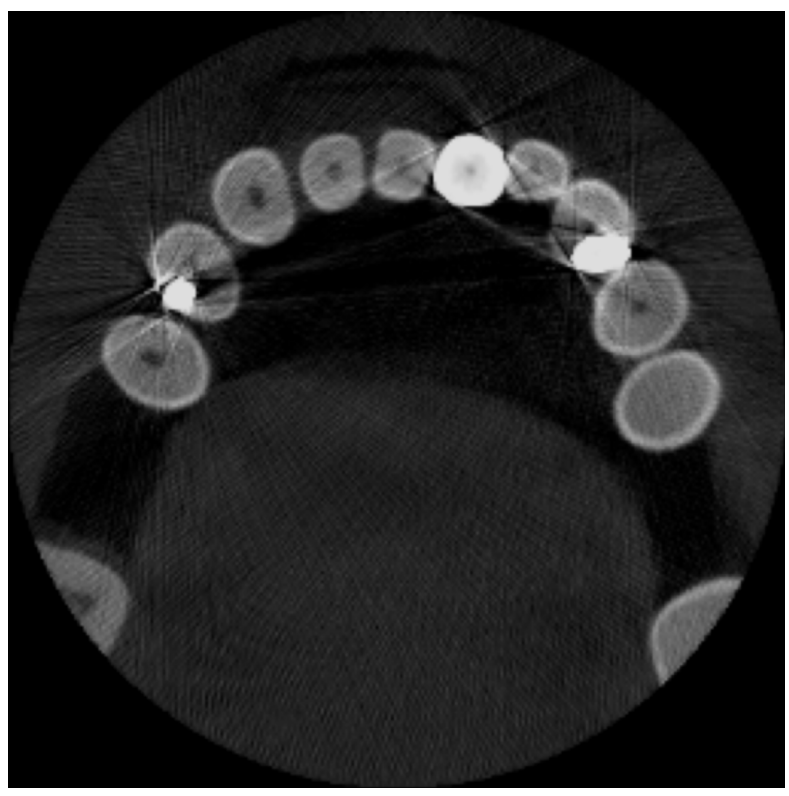


Fig. 1 - Metal Affected Input

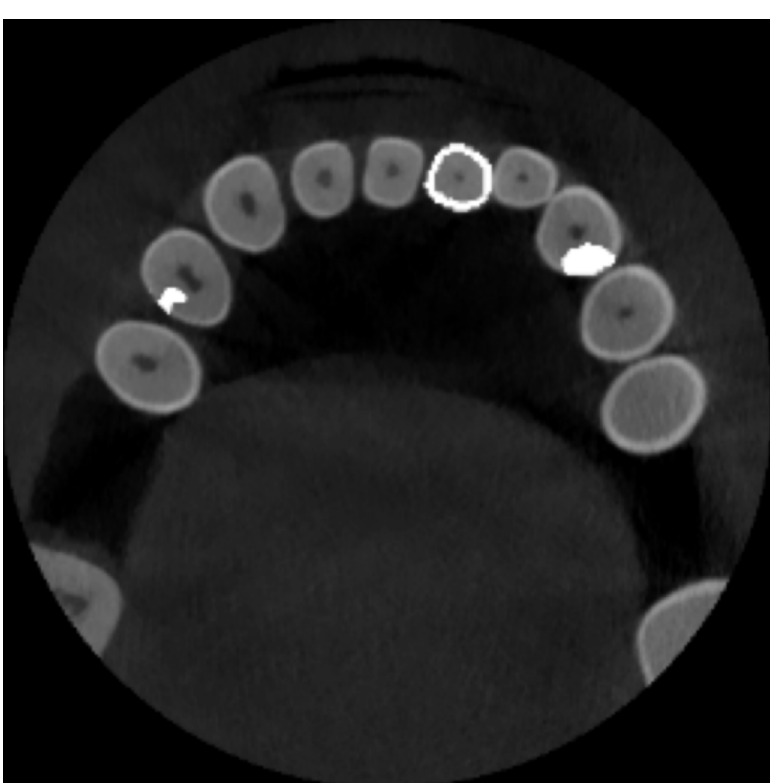
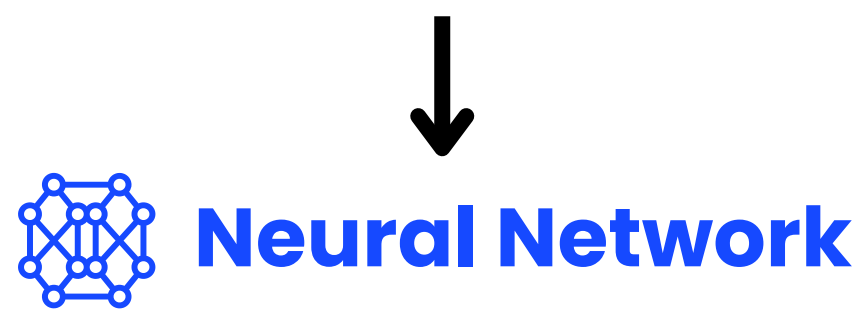


Fig. 2 - Ideal Output

## 2. GENERATED SYNTHETIC DATASET

- Naturally impossible to obtain dataset.
- Systematically generated real-like synthetic dataset based on prior teeth segmentation. (CT Scans provided by TESCOAN 3DIM)

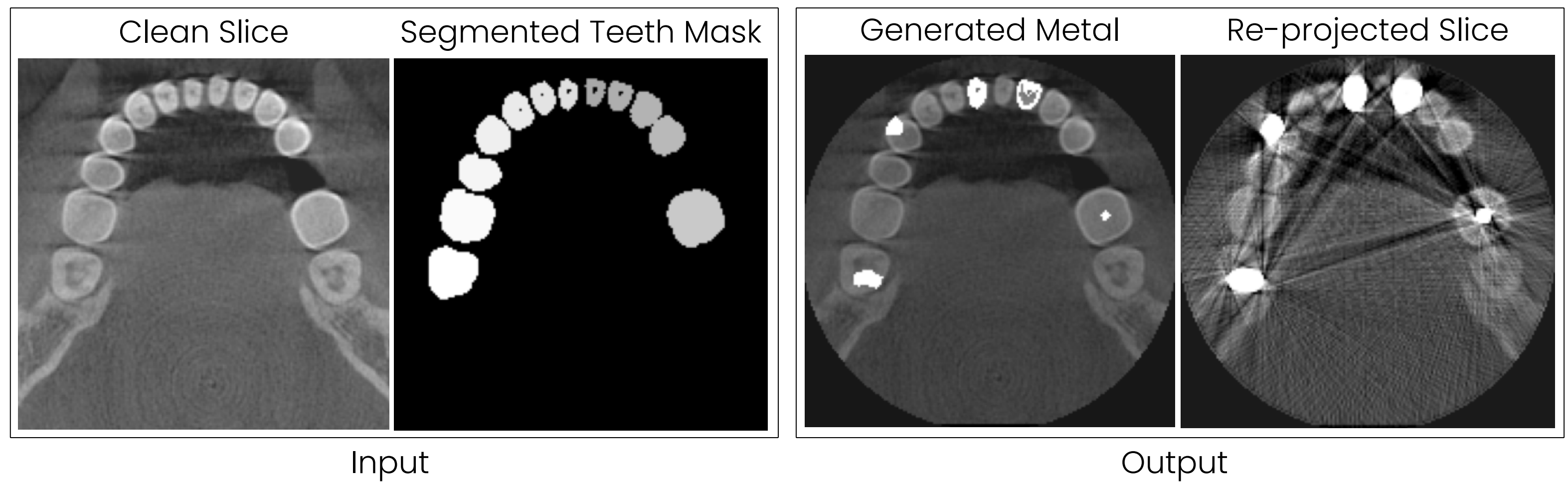


Fig. 3 - Dataset Creation Process

## 3. NETWORK ARCHITECTURE

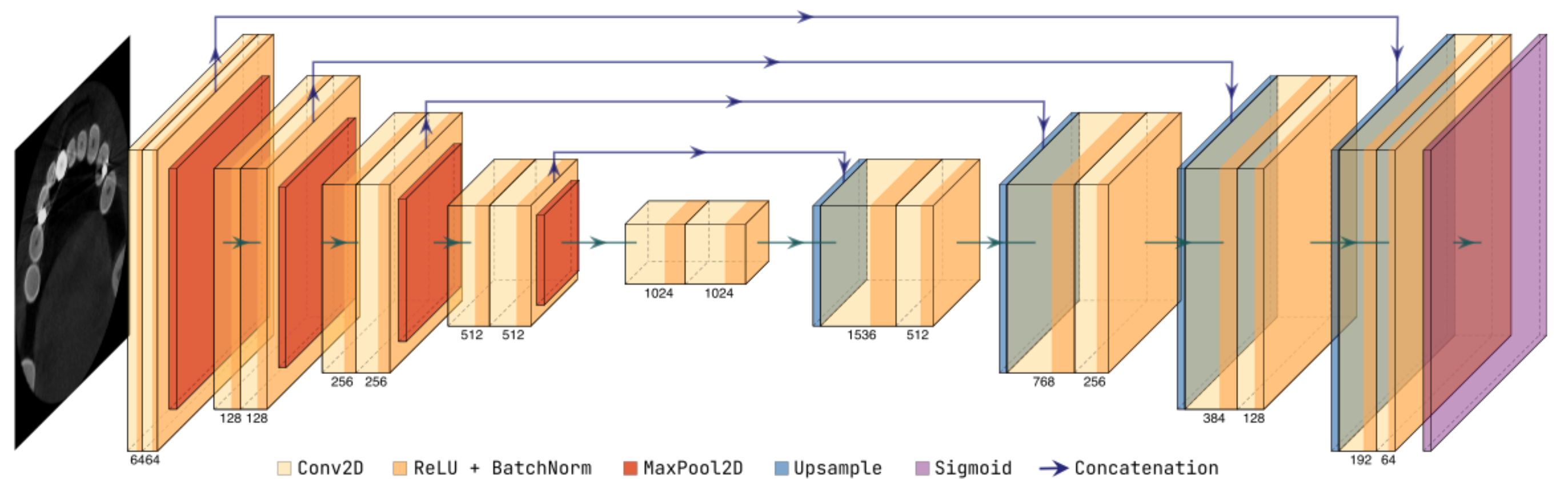


Fig. 4 - U-net-like Network Architecture

## 4. RESULTS

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

	PSNR (dB)	SSIM
Proposed Architecture	50.82	0.9873

Fig. 5 - Synthetic Dataset Results

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

	PSNR (dB)	SSIM
Proposed Architecture	<b>43.93</b>	0.9824
InDuDoNet [1]	41.48	<b>0.9904</b>

Fig. 6 - Comparison Results

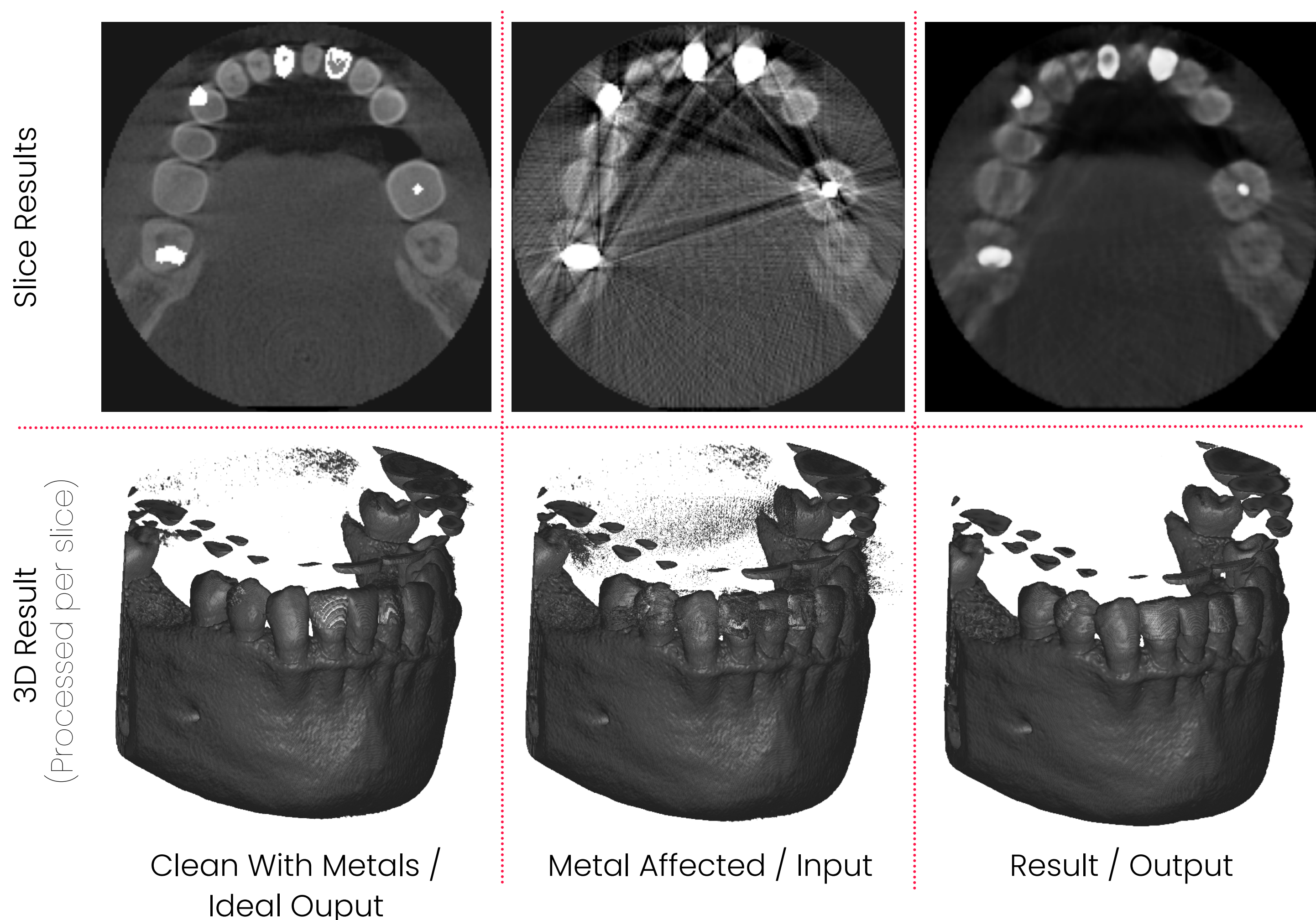


Fig. 7 - Visual Results