We use **Deep Learning** to support 3D reconstruction of patient-based gamma ray images.

Segmentation for γ-ray Image Improvement, using a U-Net

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1 Background

In surgical navigation, *3D reconstruction* is an indispensable tool. Especially for γ-tracer based Sentinel Lymph Node Biopsy (SLNB).

Problem *Improving* γ-ray images for 3D reconstruction algorithms, which can be used for Augmented Reality (AR) surgical navigation.

2 Methods

- Deep Learning approach using a U-Net for *segmenting* the *foreground signal*
- Training data from *in vitro* experiments, complemented by photon-collimator interaction *simulation data*

3 Results

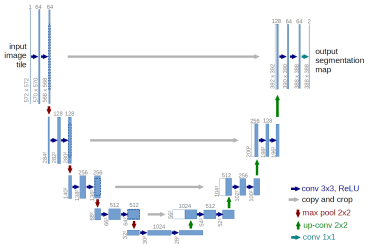
Patient γ-ray image

Segmentation: foreground signal

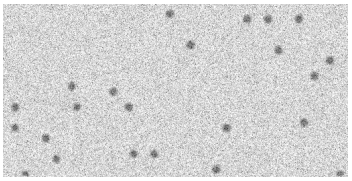
4 Discussion

- Support *inverse problem solvers*, e.g. fingerprinting, WSPGL, for 3D reconstruction by *suppression* of the noisy *background signal*

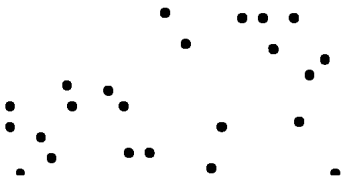
Additional figures



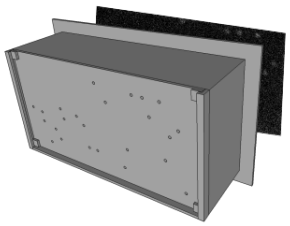
U-Net architecture



Simulated γ-ray image



Learned segmentation



Multi-pinhole collimator, γ-ray image

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