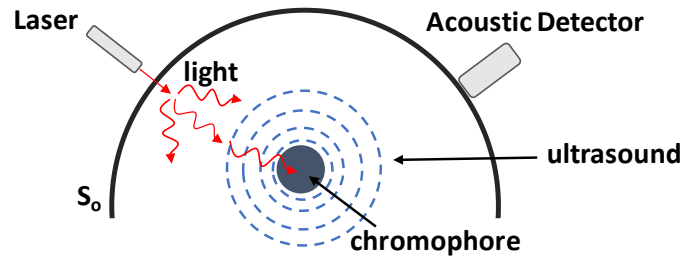


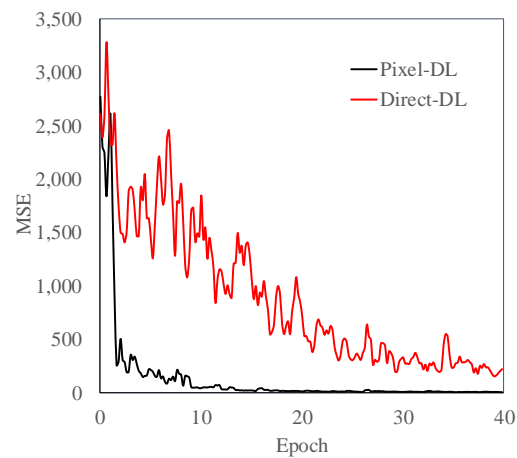
# **Limited-View and Sparse Photoacoustic Tomography for Neuroimaging with Deep Learning**

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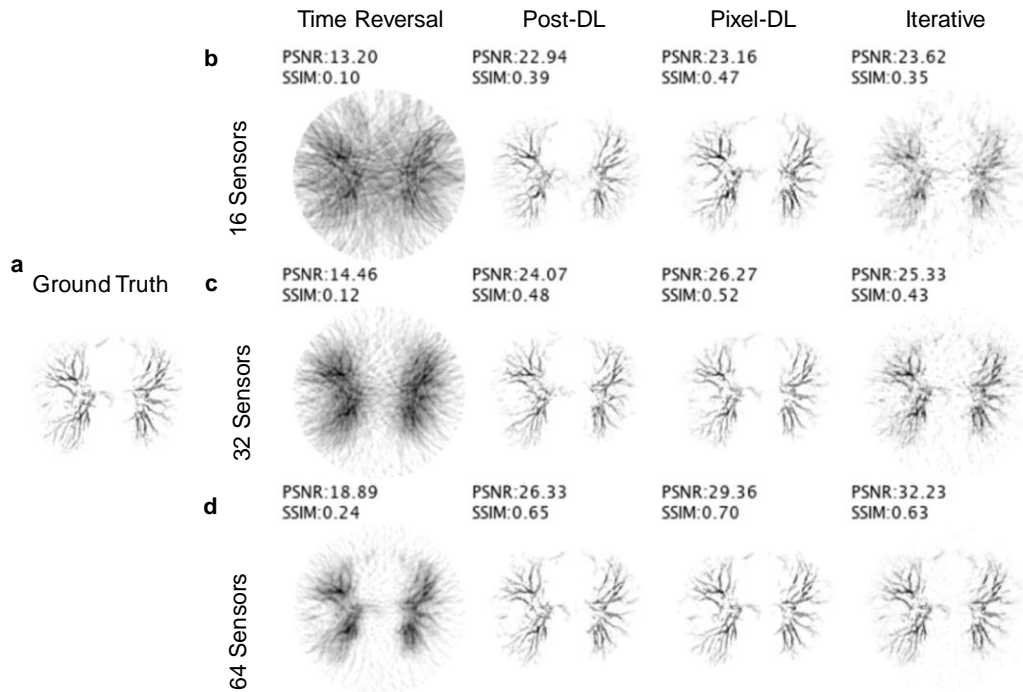
## Supplementary Figures



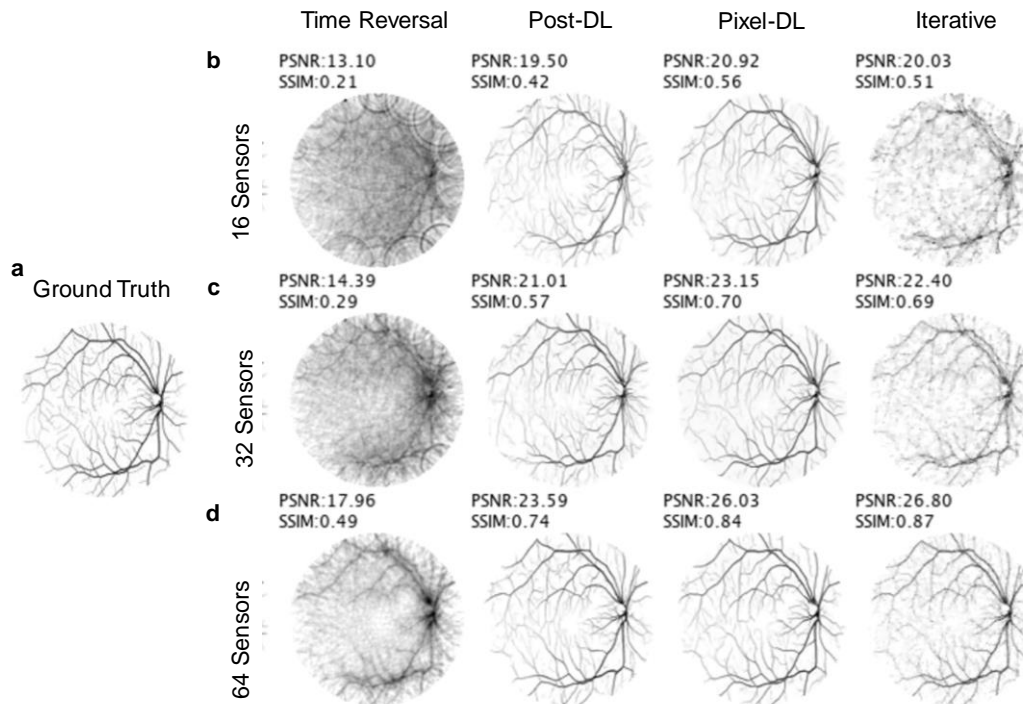
**Supplementary Fig. 1 | Diagram of Limited-View and Sparse PAT.** The biological tissue is illuminated with a pulsed nanosecond laser. Chromophores within the tissue absorb the scattering light and undergo thermoelastic expansion resulting in the generation of ultrasound. Acoustic sensors along the measurement surface  $S_0$  that partially encloses the chromophores are used to detect the emitted ultrasound.



**Supplementary Fig. 2 | Mean Squared Error (MSE) Training loss for Pixel-DL and mDirect-DL.** Pixel-DL converged faster and to a lower MSE loss compared mDirect-DL. The mDirect-DL CNN did learn to reconstruct an image from the interpolated sensor data but learned features that did not generalize and overfitted to the training data.



**Supplementary Fig. 3 | Limited-view and sparse PAT image reconstruction of lung vasculature.** PAT sensor data acquired with a semi-circle limited-view sensor array at varying sparsity levels. **a**, Ground truth image used to simulate PAT sensor data. **b**, PAT reconstructions with 16 sensors. **c**, PAT reconstructions with 32 sensors. **d**, PAT reconstructions with 64 sensors.



**Supplementary Fig. 4 | Limited-view and sparse PAT image reconstruction of fundus vasculature.** PAT sensor data acquired with a semi-circle limited-view sensor array at varying sparsity levels. **a**, Ground truth image used to simulate PAT sensor data. **b**, PAT reconstructions with 16 sensors. **c**, PAT reconstructions with 32 sensors. **d**, PAT reconstructions with 64 sensors.