Supplementary Materials

A U-Net-like architecture [24] was used for the lesion detection (Fig. S1). The neural network has performed well on lesion detection in PET datasets. The down-sampling path contains four residual learning blocks [25]. In the up-sampling path, there are four residual learning blocks and two transposed convolutional layers [26] to aggregate contextual information [27].

The model was optimized with a Combo loss, which is a linear combination of binary cross-entropy loss and Dice loss [28].

where is the ith value of the gold-standard label and is the ith value of the corresponding prediction .

Implementation Details

We empirically set , , . We optimize the lesion detection network using stochastic gradient descent with Nesterov momentum: learning rate = 0.0005, momentum = 0.99, batch size = 8, and total iterations = 105.

Additionally, a data augmentation module was used to help train the model. The module consists of random shifting, random flipping, and random rotation.



**Figure S1.** Model Training for Lesion Detection - Network architecture.