Optical information transfer through random unknown diffusers using electronic encoding and diffractive decoding

Supplementary Information

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Supplementary Figures and Video

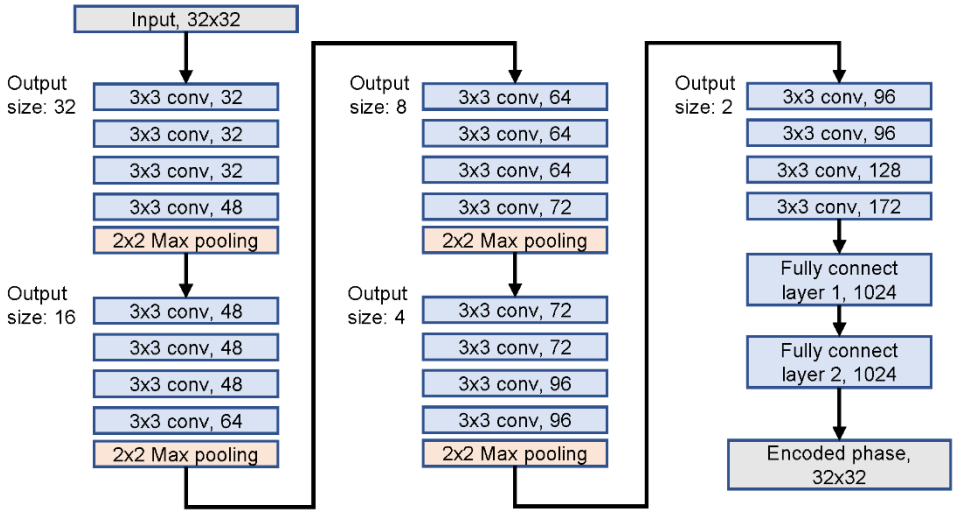


Fig. S1 The architecture of the electronic encoder neural network (CNN).

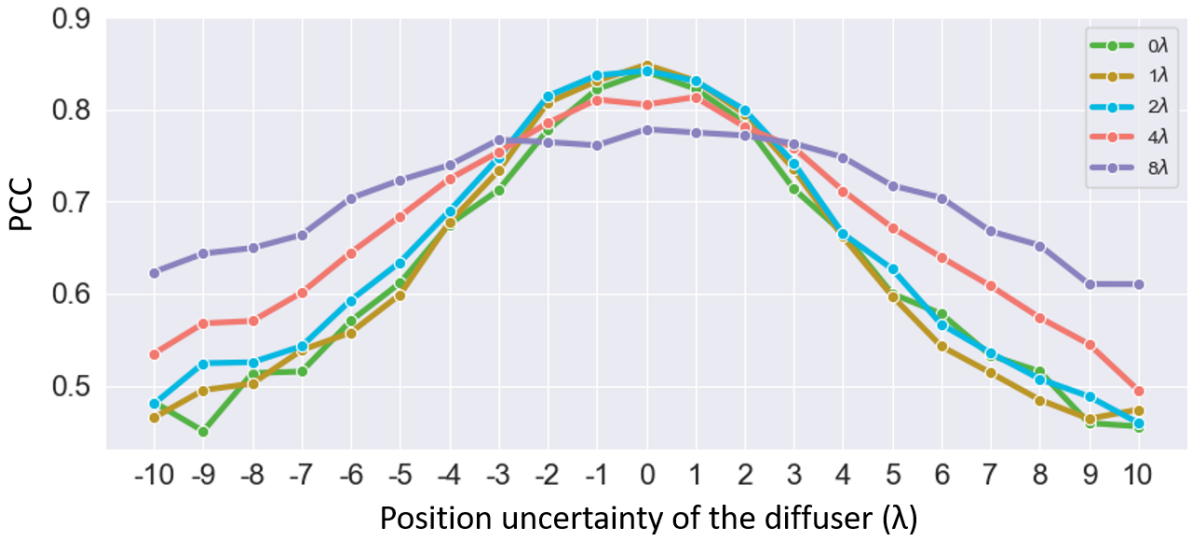
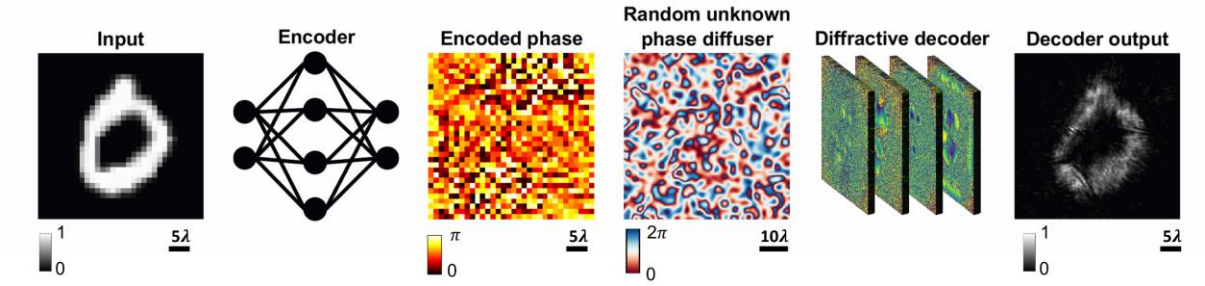


Fig. S2 The data transmission fidelity as a function of the diffuser position uncertainty. Five hybrid models were trained with varying vaccination levels, i.e., 0λ (no vaccination), $\pm 1\lambda$, 2λ, 4λ and 8λ to transfer the optical information of interest through random phase diffusers with a correlation length of $L = 5\lambda$, while maintaining all other parameters the same.



Video 1 Results of the electronic encoder and the diffractive decoder (jointly-trained) that transfer different optical images of interest through random unknown phase diffusers which are constantly evolving. (MP4, 13.3 MB)