The Effects of Noise on Deep Learning Architectures

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Optical systems provide useful features that can benefit neural networks, for both training and inference. Many operations commonly used in neural networks can be performed extremely efficiently when implemented with optics.

Noise is usually undesirable in optical systems, however, it is often injected into deep learning systems to increase accuracy or speed up training. We are interested in investigating into the effects noise will have on deep neural networks, finding the balance between a beneficial level of noise and too much. In this talk I will present results from exploring these effects by simulating noisy computations.