

Improving Learning in a Connected Environment

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A paradigm shift can be observed in wide-ranging application domains such as entertainment industry, energy management, environmental aware transport modelling, mechatronics and the broader spectrum of design, which are empowered by rapidly advancing technologies that can generate large quantities of “imperfect” data for analysis of processes and compounds. These technologies have been spurred by the improvements in connectivity and processor technology (e.g. GPU). In a connected world, learning from data plays a significant role. In this context, I discuss about improving learning methods with examples from our own research.

The recent learning strategies include Generative adversarial nets (GANs) that are widely used to learn the data sampling process. The performance of GANs and their future applications heavily depend on the improvements to learning algorithm. The maximum mean discrepancy (MMD) is used as the loss function in MMD-GAN which discourages the learning of fine details in data. Our recently published research suggests that a repulsive loss function can help to learn better in MMD-GAN. The improved methods are applied in unsupervised image generation tasks on CIFAR-10, STL-10, CelebA, and LSUN bedroom datasets with significantly improved results.