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Deep Generative Models and Applications to Physics

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Generative models leveraging the recent advances in Deep Neural Networks (DNNs) have enabled incredible applications in diverse fields such as, machine vision, speech, and finance. After giving a brief historical perspective, this presentation introduces the concepts and principles behind deep generative models, focusing mainly on an important sub-class, namely, Generative Adversarial Networks (GANs). Using selected examples, we briefly explore applications of generative models to problems in physics and their implications. The presentation concludes with recent results using GANs for image synthesis and manipulation of satellite imagery to facilitate the training of object detection/segmentation networks.

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