

Generative Adversarial Networks

IKHAN CHOI

The AI paradigm changes when a new approximating method is discovered.

1. MAXIMUM LIKELIHOOD ESTIMATE

2. GRADIENT DESCENT METHOD

ascending stochastic gradient

3. MINIMAX GAME

Minimax is a *decision policy* in a competitive game.

4. GENERATIVE ADVERSARIAL NETWORKS

Let X be the set of images. Suppose the data distribution p_{data} on X which embodies learning materials is given. If $x \in X$ is an image that looks like a real human face, then the distribution function p_{data} has nonnegligible values near the point x . We cannot describe the distribution function p_{data} completely, but only can sample from it.

Let p_g be a distribution on X . The generator $G : \Omega \rightarrow X$ is just an arbitrarily taken random variable satisfying p_g for sampling. The discriminator $D : X \rightarrow [0, 1]$ is a function. Our purpose is to construct a new method for approximating $p_g \rightarrow p_{data}$ by simultaneously updating the discriminator function D .

Balancing the convergence rates between p_g and D is important.