Private Generative Adversarial Network

Pengfei

Generative Adversarial Networks (GANs)

- Proposed by Goodfellow et al. in 2014

- One of the most popular generative network in recent research

Generative Adversarial Networks (GANs)

- Discriminator and Generator play the two-player minimax game with value function (objective function) V (G, D) :

$$\min_{G} \max_{D} V(D,G) = \mathbb{E}_{\boldsymbol{x} \sim p_{\text{data}}(\boldsymbol{x})}[\log D(\boldsymbol{x})] + \mathbb{E}_{\boldsymbol{z} \sim p_{\boldsymbol{z}}(\boldsymbol{z})}[\log(1 - D(G(\boldsymbol{z})))]$$

- z: random variables following p(z)

- G(z): synthetic data generated by Generator

- D(x): probability generated by Discriminator that x came from the real data

real data
$x \sim p_{data}(x)$

$z \sim p_z(z)$

prior

Generator
Network
$G(z)$

generated data

Discriminator
Network with
DP $D(x)$

sigmoid
function

real

synthetic