Value Function Analysis

Discriminator Maximizes

Correctly classify real and fake samples

$$\max_D V(D,G)$$

Generator Minimizes

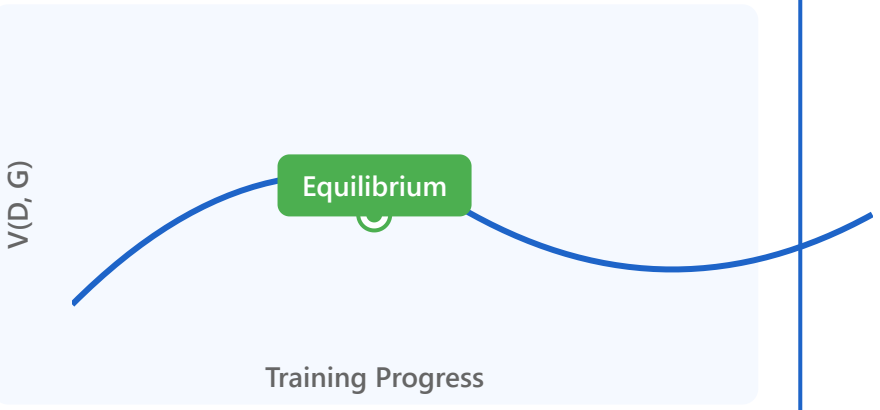
Fool the discriminator effectively

$$\min_G V(D,G)$$

Theoretical Insights

- Cross-entropy loss interpretation
- Jensen-Shannon divergence connection
- Global optimality guarantees

Value Function Landscape



Optimal Discriminator

$$D^*(x) = p_{data}(x) / (p_{data}(x) + p_g(x))$$

Global Optimality Conditions

Theoretical Optimum	Discriminator at Equilibrium	Value Function
$p_g = p_{data}$	$D^*(x) = 1/2$	$V(D^*, G^*) = -\log(4)$