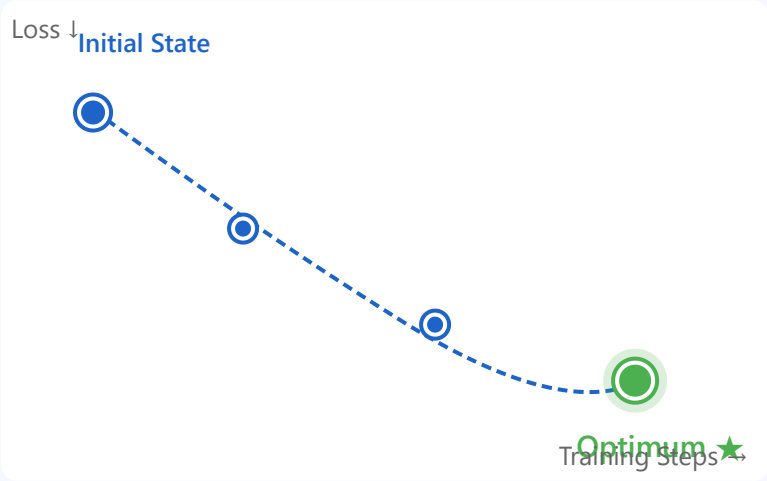
Global Optimum

🎯 Theorem

Global minimum achieved if and only if $p_g = p_{data}$

Convergence Trajectory



At Global Optimum

Discriminator	$D^*(x) = 1/2$
Value Function	$V = -\log(4)$
Distributions	$p_g = p_{data}$

JS Divergence Connection

Minimizing GAN objective equals minimizing Jensen-Shannon divergence

$$JS(p_{data} \,||\, p_g) = 0 \Leftrightarrow p_g = p_{data}$$

✓ Convergence Properties

- Uniqueness of global optimum
- Proof under ideal conditions
- Theoretical guarantees

⚠ Practical Challenges

- Mode collapse issues
- Training instability
- Non-convex optimization