

DDPM Sampling

Part 4/7: Sampling

1 Initialize from Pure Noise

$$x_T \sim N(0, I)$$



Iterative Denoising

$t = T, T-1, \dots, 1$

① Predict Noise

$$\hat{\varepsilon} = \varepsilon_\theta(x_t, t)$$

② Compute Mean

$$\mu_\theta(x_t, t)$$

③ Sample Noise

$$z \sim N(0, I) \text{ if } t > 1, \text{ else } z=0$$

④ Update State

$$x_{t-1} = \mu_\theta(x_t, t) + \sigma_t \cdot z$$

3 Final Output

x_0 is the generated sample

 Time Complexity: $O(T)$ forward passes • Typically $T = 1000$