Deep Dive into Score Function

Part 3/7: Reverse Process

📊 Score Definition

$$\nabla_x \log p(x)$$

Indicates direction of density increase

Connection

Denoising ≈ Score matching

Tweedie's Formula

Score relates to optimal denoising estimation

Score Estimation

$$\varepsilon_\theta(x_t,t) \approx -\sqrt{1-\bar{\alpha}_t} \cdot \nabla_{x_t} \log p(x_t)$$

Langevin Dynamics

Reverse process as Langevin sampling from the score function

Continuous Limit

Score-based SDEs when T → ∞

Unified View

Diffusion and score-based models are equivalent