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GAN:
VAE
Nor-
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Flows:
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$q(\mathbf{x}_t|\mathbf{x}_0) = \mathcal{N}(\mathbf{x}_t; \sqrt{\overline{\alpha}_t}\mathbf{x}_0, (1-\overline{\alpha}_t)\mathbf{I})$

$q(\mathbf{x}_t|\mathbf{x}_0) = \mathcal{N}(\mathbf{x}_t; \sqrt{\overline{\alpha}_t}\mathbf{x}_0, (1-\overline{\alpha}_t)\mathbf{I})$

t
$\mathbf{x}_{t-1}$
$q(\mathbf{x}_t|\mathbf{x}_{t-1}) = \mathcal{N}(\mathbf{x}_t; \sqrt{\alpha_t}\mathbf{x}_{t-1}, (1-\alpha_t)\mathbf{I})$
α_t
$\mathbf{x}_0$
$\mathbf{x}_t$
$\mathbf{x}_t$
$\mathbf{x}_0$
$\mathbf{x}_t = \sqrt{\alpha_t}\mathbf{x}_{t-1} + \sqrt{1-\alpha_t}\epsilon_t$
$\epsilon_t \sim$
$\mathcal{N}(0, \mathbf{I})$
t
$\mathbf{x}_t$
$\mathbf{x}_0$
$\mathbf{x}_{t-1}$
$\mathbf{x}_{t-1} = \sqrt{\alpha_{t-1}}\mathbf{x}_{t-2} + \sqrt{1-\alpha_{t-1}}\epsilon_{t-1}$
$\mathbf{x}_0$
$\mathbf{x}_t = \sqrt{\alpha_t}(\sqrt{\alpha_{t-1}}\mathbf{x}_{t-2} + \sqrt{1-\alpha_{t-1}}\epsilon_{t-1}) + \sqrt{1-\alpha_t}\epsilon_t$
$= \sqrt{\alpha_t\alpha_{t-1}}\mathbf{x}_{t-2} + \sqrt{\alpha_t(1-\alpha_{t-1})}\epsilon_{t-1} + \sqrt{1-\alpha_t}\epsilon_t$

$$\mathbf{x}_t = \left(\prod_{s=1}^{t}\sqrt{\alpha_s}\right)\mathbf{x}_0 + \sum_{s=1}^{t}\sqrt{1-\alpha_s}\left(\prod_{u=s+1}^{t}\sqrt{\alpha_u}\right)\epsilon_s$$

$\overline{\alpha}_t =$
$\prod_{s=1}^{t}\alpha_s$
$$\mathbf{x}_t = \sqrt{\overline{\alpha}_t}\mathbf{x}_0 + \sum_{s=1}^{t}\sqrt{1-\alpha_s}\left(\prod_{u=s+1}^{t}\sqrt{\alpha_u}\right)\epsilon_s$$

ϵ_s
$\mathbf{x}_t$

$E[\mathbf{x}_t] = \sqrt{\overline{\alpha}_t}\mathbf{x}_0$

$\mathbf{x}_t$

$$Var(\mathbf{x}_t) = \sum_{s=1}^{t}(1-\alpha_s)\left(\prod_{u=s+1}^{t}\alpha_u\right) = (1-\overline{\alpha}_t)\mathbf{I}$$

$\mathbf{x}_t$
$\mathbf{x}_0$
$q(\mathbf{x}_t|\mathbf{x}_0) = \mathcal{N}(\mathbf{x}_t; \sqrt{\overline{\alpha}_t}\mathbf{x}_0, (1-\overline{\alpha}_t)\mathbf{I})$
$q(\mathbf{x}_{t-1}|\mathbf{x}_t)$
T
$\mathbf{x}_0$

$q(\mathbf{x}_t|\mathbf{x}_{t-1}) = \mathcal{N}(\mathbf{x}_t; \sqrt{\alpha_t}\mathbf{x}_{t-1}, (1-\alpha_t)\mathbf{I})$

α_t
$\mathbf{x}_t$
$\mathbf{x}_0$
$q(\mathbf{x}_t|\mathbf{x}_0) = \mathcal{N}(\mathbf{x}_t; \sqrt{\overline{\alpha}_t}\mathbf{x}_0, (1-\overline{\alpha}_t)\mathbf{I})$
$\mathbf{x}_t$
t
$\mathbf{x}_0$
$\mathbf{x}_0$
$\mathbf{x}_T$
$\mathbf{x}_0$
p_θ
$p_\theta(\mathbf{x}_{t-1}|\mathbf{x}_t) = \mathcal{N}(\mathbf{x}_{t-1}; \mu_\theta(\mathbf{x}_t, t), \Sigma_\theta(\mathbf{x}_t, t))$
μ_θ
Σ_θ