

TABLE 8
Details for Improved Diffusion Methods

Method	Year	Data	Model	Framework	Training	Sampling	Code
Landmark Works							
DPM [25]	2015	RGB Image	Discrete	Diffusion	L_{simple}	Ancestral	[code]
DDPM [68]	2020	RGB Image	Discrete	Diffusion	L_{simple}	Ancestral	[code]
NCSN [69]	2019	RGB Image	Discrete	Score	L_{DSM}	Langevin dynamics	[code]
NCSNv2 [239]	2020	RGB Image	Discrete	Score	L_{DSM}	Langevin dynamics	[code]
Score SDE [66]	2020	RGB Image	Continuous	SDE	L_{DSM}	PC-Sampling	[code]
Improved Works							
Progressive Distill [62]	2022	RGB Image	Discrete	Diffusion	L_{simple}	DDIM Sampling	[code]
Denoising Student [85]	2021	RGB Image	Discrete	Diffusion	$L_{Distill}$	DDIM Sampling	[code]
TDDPM [86]	2022	RGB Image	Discrete	Diffusion	$L_{DDPM\&GAN}$	Ancestral	-
ES-DDPM [87]	2022	RGB Image	Discrete	Diffusion	$L_{DDPM\&VAE}$	Conditional Sampling	[code]
CCDF [88]	2021	RGB Image	Discrete	SDE	L_{simple}	Langevin dynamics	[code]
Franzese’s Model [89]	2022	RGB Image	Continuous	SDE	L_{DSM}	DDIM Sampling	-
FastDPM [90]	2021	RGB Image	Discrete	Diffusion	L_{simple}	DDIM Sampling	[code]
Improved DDPM [61]	2021	RGB Image	Discrete	Diffusion	L_{hybrid}	Ancestral	[code]
VDM [67]	2022	RGB Image	Both	Diffusion	L_{simple}	Ancestral	[code]
San-Roman’s Model [91]	2021	RGB Image	Discrete	Diffusion	$L_{DDPM\&Noise}$	Ancestral	-
Analytic-DPM [92]	2022	RGB Image	Discrete	Score	$L_{Trajectory}$	Ancestral	[code]
NPR-DDPM [93]	2022	RGB Image	Discrete	Diffusion	$L_{DDPM\&Noise}$	Ancestral	[code]
SN-DDPM [93]	2022	RGB Image	Discrete	Score	L_{square}	Ancestral	[code]
DDIM [77]	2021	RGB Image	Discrete	Diffusion	L_{simple}	DDIM Sampling	[code]
gDDIM [95]	2022	RGB Image	Continuous	SDE&ODE	L_{DSM}	PC-Sampling	[code]
INDM [105]	2022	RGB Image	Continuous	SDE	$L_{DDPM\&Flow}$	PC-Sampling	-
Ito-Taylor [23]	2021	RGB Image	Continuous	SDE	L_{DSM}	Ideal Derivatives Sampling	-
Gotta Go Fast [94]	2021	RGB Image	Continuous	SDE	L_{DSM}	Improved Euler	[code]
DPM-Solver [64]	2022	RGB Image	Continuous	ODE	L_{DSM}	Higher ODE solvers	[code]
iODE [97]	2022	RGB Image	Continuous	ODE	L_{DSM}	2 nd Order Heun	[code]
PNM [76]	2022	Manifold	Discrete	ODE	L_{simple}	Multi-step & Runge-Kutta	[code]
DDSS [99]	2021	RGB Image	Discrete	Diffusion	L_{simple}	Dynamic Programming	-
GGDM [96]	2022	RGB Image	Discrete	Diffusion	L_{KID}	Dynamic Programming	-
Diffusion GAN [63]	2022	RGB Image	Discrete	Diffusion	$L_{DDPM\&GAN}$	Ancestral	[code]
DiffuseVAE [100]	2022	RGB Image	Discrete	Diffusion	$L_{DDPM\&VAE}$	Ancestral	[code]
DiffFlow [101]	2021	RGB Image	Discrete	SDE	L_{DSM}	Langevin & Flow Sampling	[code]
LSGM [102]	2021	RGB Image	Continuous	ODE	$L_{DDPM\&VAE}$	ODE-Solver	[code]
Score-flow [103]	2021	Dequantization	Continuous	SDE	L_{DSM}	PC-Sampling	[code]
PDM [104]	2022	RGB Image	Continuous	SDE	L_{Gap}	PC-Sampling	-
ScoreEBM [106]	2021	RGB Image	Discrete	Score	$L_{Recovery}$	Langevin dynamics	[code]
Song’s Model [107]	2021	RGB Image	Discrete	Score	L_{DSM}	Langevin dynamics	-
Huang’s Model [111]	2021	RGB Image	Continuous	SDE	L_{DSM}	SDE-Solver	[code]
De Bortoli’s Model [110]	2021	RGB Image	Continuous	SDE	L_{DSM}	Importance Sampling	[code]
PVD [112]	2021	Point Cloud	Discrete	Diffusion	L_{simple}	Ancestral	[code]
Luo’s Model [33]	2021	Point Cloud	Discrete	Diffusion	L_{simple}	Ancestral	[code]
Lyu’s Model [34]	2022	Point Cloud	Discrete	Diffusion	L_{simple}	Farthest Point Sampling	[code]
D3PM [65]	2021	Categorical Data	Discrete	Diffusion	L_{hybrid}	Ancestral	[code]
Argmax [114]	2021	Categorical Data	Discrete	Diffusion	$L_{DDPM\&Flow}$	Gumbel sampling	[code]
ARDM [115]	2022	Categorical Data	Discrete	Diffusion	L_{simple}	Ancestral	[code]
Campbell’s Model [116]	2022	Categorical Data	Continuous	Diffusion	L_{CT}^{simple}	PC-Sampling	[code]
VQ-diffusion [117]	2022	Vector-Quantized	Discrete	Diffusion	L_{simple}	Ancestral	[code]
Improved VQ-Diff [118]	2022	Vector-Quantized	Discrete	Diffusion	L_{simple}	Purity Prior Sampling	[code]
Cohen’s Model [119]	2022	Vector-Quantized	Discrete	Diffusion	L_{simple}	Ancestral & VAE Sampling	[code]
Xie’s Model [120]	2022	Vector-Quantized	Discrete	Diffusion	$L_{DDPM\&Class}$	Ancestral & VAE Sampling	-
RGS [121]	2022	Manifold	Continuous	SDE	L_{DSM}	Geodesic Random Walk	-
RDM [122]	2022	Manifold	Continuous	SDE	L_{CT}^{simple}	Importance Sampling	-
EDP-GNN [123]	2020	Graph	Discrete	Score	L_{DSM}	Langevin dynamics	[code]
NCSN++ [124]	2021	RGB Image	Continuous	SDE	L_{DSM}	PC-Sampling	[code]