

08 Requirements and evaluation

Figure 1 coordinate 8 | Subitems 25, 26, 27

Machine learning

25 Fidelity

Real / synthetic data -> scores
PRDC: fidelity versus coverage
Declare the reference features
Test outliers / missing modes

26 Efficiency

Same workload -> cost / quality
Time / memory / training budget
Keep a declared quality target
Test full runtime, same hardware

27 Measurement consistency

Data + operator -> reconstruction
A prior fills unobserved parts
Respect the stated noise model
Test residual / unresolved detail

Computer vision

— GenEval compositional checks

Prompt + image -> alignment test
Check count, color and position
Target requested object relations
Test attribute binding, not looks

— DPM-Solver sampling

Trained diffusion prior -> image
Use fewer model evaluations
Check quality at each budget
Test wall time, not step count

— DDNM null-space restoration

Linear observation -> image
Generate null-space content
Keep noiseless measurements
Test data fit and structure

Medical image analysis

— Pathologist-guided alignment

Synthetic tissue -> expert review
Reward-guided diffusion tuning
Target meaningful tissue features
Test independent diagnostic truth

— MAISI-v2 volume synthesis

Noise + conditions -> 3D image
Rectified flow speeds synthesis
Check anatomy and condition fit
Test total time, failures, retries

— Score-based CT / MRI

Measured data -> image draws
Supply the operator at test time
Target noise-aware data fit
Test residuals / hidden anatomy