Noise Schedule Improvements

Part 6/7: Advanced Techniques

📈 Evolution of Noise Schedules

📏 **Original**

Linear Schedule

Original DDPM approach

$\beta\_t: 1e-4 \rightarrow 0.02$

〰️ **Improved**

Cosine Schedule

Smoother transition, better for high-res

🧠 **Advanced**

Learned Schedule

Network learns optimal β_t during training

⚗️ Key Concepts & Innovations

📊 **Signal-to-Noise Ratio**

$SNR(t) = \bar{\alpha}\_t / (1-\bar{\alpha}\_t)$

🎯 **V-parameterization**

Predict velocity v_t instead of noise

⚡ **EDM Framework**

Exponential noise for better scaling

♾️ **Continuous Time**

Formulate as continuous SDE

✨ Impact: Better sample quality and training stability