

Unanswered Questions Summary (with References)

1. Multi-dimensional SDE and Probability Flow ODE:

References:

- Song, Yang, et al. "Score-Based Generative Modeling through SDEs." ICLR 2021.
- Anderson, Brian D.O. "Reverse-time diffusion equation models." Stochastic Processes 1982.

2. Universal Approximation Theorem:

References:

- Cybenko, George. "Approximation by superpositions of sigmoidal functions." Math. Control Signals Systems, 1989.
- Hornik, Kurt. "Approximation capabilities of multilayer feedforward networks." Neural Networks, 1991.

3. One-hot Encoding vs Direct Regression:

References:

- Bishop, C.M. "Pattern Recognition and Machine Learning." 2006.
- Goodfellow, Bengio, Courville. "Deep Learning." MIT Press, 2016.

4. Multi-class Classification Boundaries:

References:

- Hastie, Tibshirani, Friedman. "The Elements of Statistical Learning." 2001.

5. DSM for 3D Images:

References:

- Vincent, Pascal. "A connection between score matching and denoising autoencoders." Neural Computation 2011.
- Song, Yang & Ermon, Stefano. "Denoising Score Matching with Langevin Dynamics." NeurIPS 2019.

6. Sliced Score Matching Random Directions:

References:

- Song, Yang, et al. "Sliced Score Matching." AISTATS 2020.

7. Better Distributions for SSM Projection:

References:

- Huang et al. "Projected Score Matching." 2020 (related exploration).
- This remains partly open; no definitive best distribution known.