

Beyond Sequential Inference: Discrete Generative Models and Multitask Stochastic Interpolants

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Abstract

Generative AI has exploded in recent years, with large language models receiving widespread attention. However, alongside LLMs, another class of generative methods has emerged based on score-based diffusion and flow matching with stochastic interpolants.

While all generative models are probabilistic in nature, methods in this second class use dynamical transportation of measures to transform noise into data.

Recently, these ideas have been generalized to the discrete setup, opening new possibilities for structured generation. Unlike LLMs, which generate tokens sequentially, discrete generative models based on transport offer the flexibility to perform inference in any order.

In this talk, I will discuss what this order-agnostic generation entails and demonstrate how it can be advantageous for specific tasks where strategically choosing the order of token generation improves inference quality.

Finally, I will present how this paradigm can be generalized back to the continuous setting using what we call multitask stochastic interpolants, providing a unified framework that bridges discrete and continuous generation.