

Generative AI

Weijie Zhao

4/2/2024

HW4: Discrete Logarithm

- This assignment is to compute discrete logarithm
- Given A , B , and M , generate an X that satisfies
 - $\text{pow}(A, X) \bmod M = B$
 - where M is a prime
 - $0 \leq A, B < M$
- 8 logical CPUs, and 2 GPUs
- The time limit for each case is 1 minute

- Due: 4/12/2024 5:00pm EDT

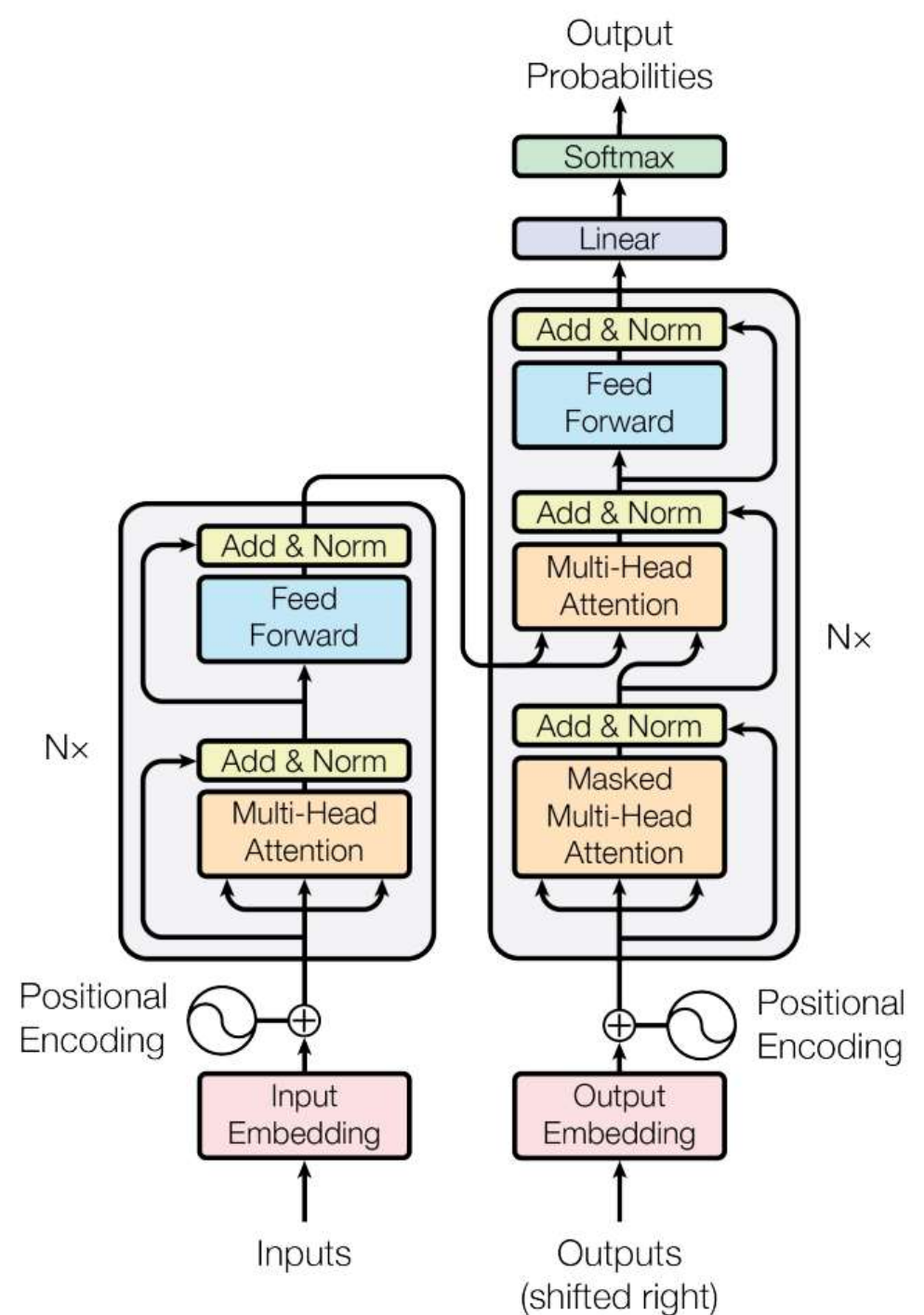
Transformers

- Attention is All You Need
- Attention
- Self-attention
- Masked self-attention
- Positional encoding

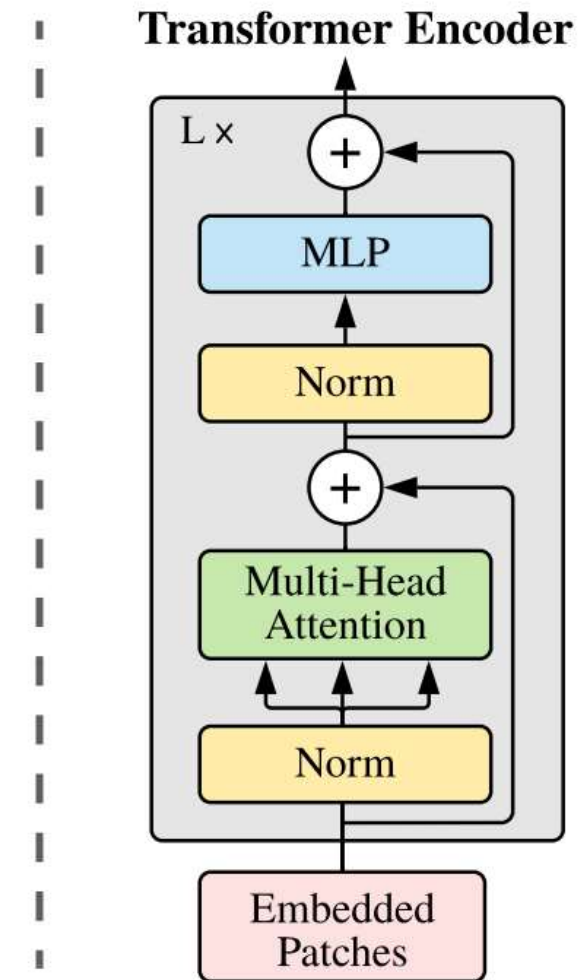
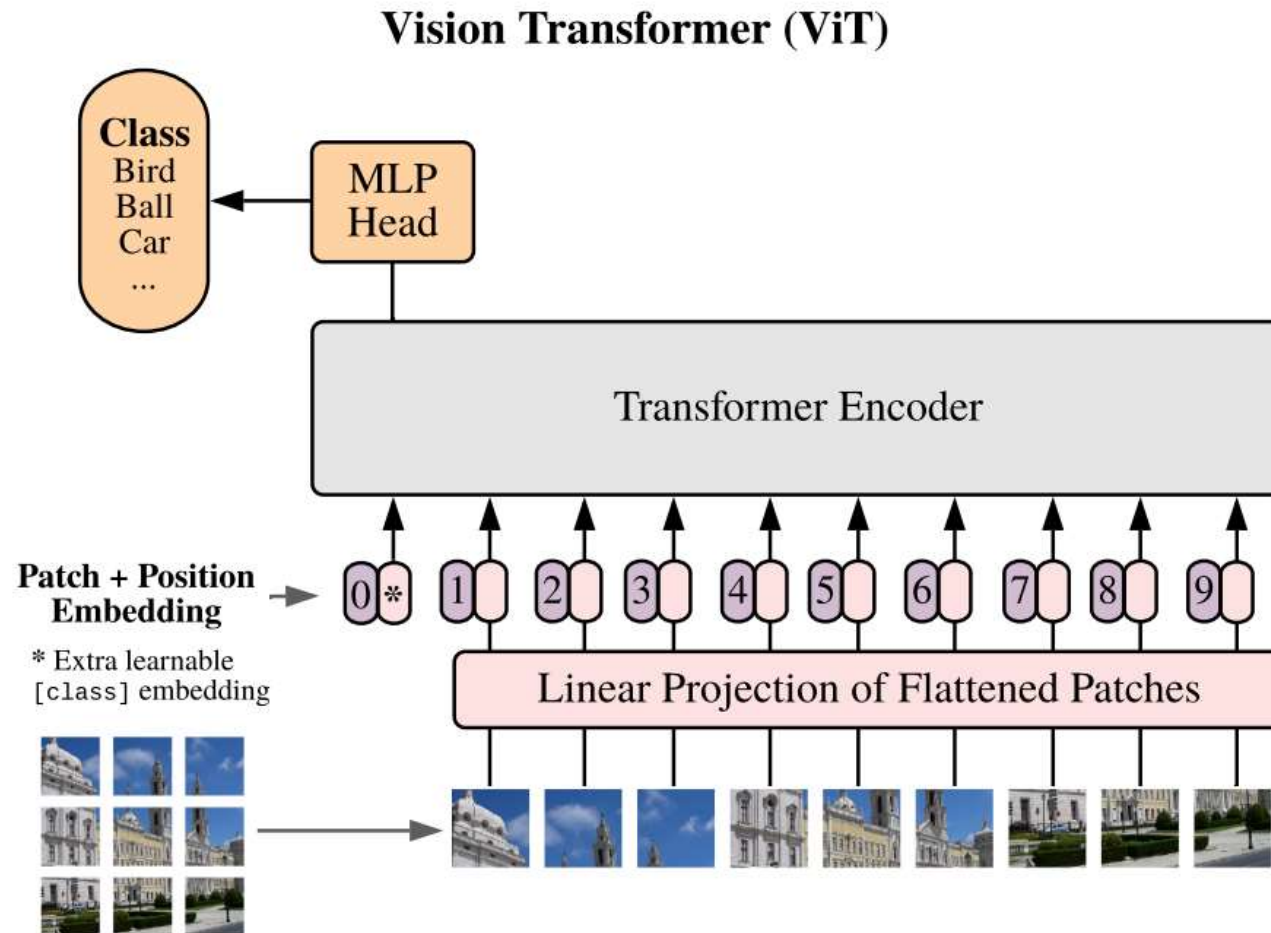
$$\text{Attention}(Q, K, V) = \text{softmax}\left(\frac{QK^T}{\sqrt{d_k}}\right)V$$

$$PE_{(pos, 2i)} = \sin(pos/10000^{2i/d_{\text{model}}})$$

$$PE_{(pos, 2i+1)} = \cos(pos/10000^{2i/d_{\text{model}}})$$

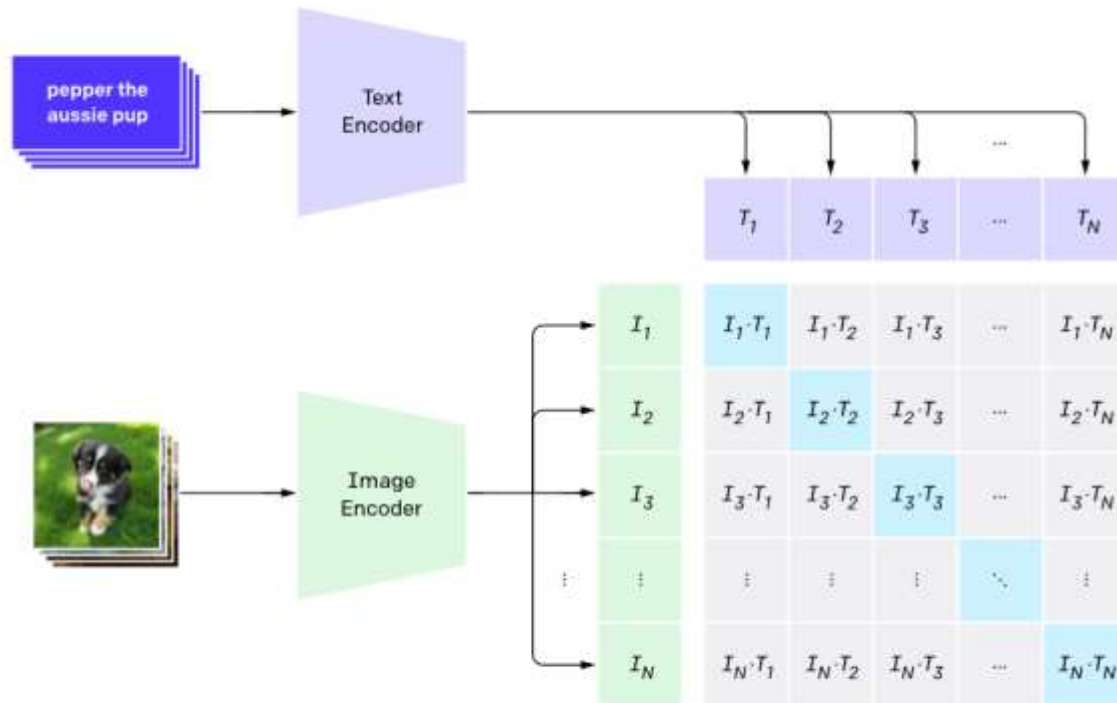


Vision Transformer

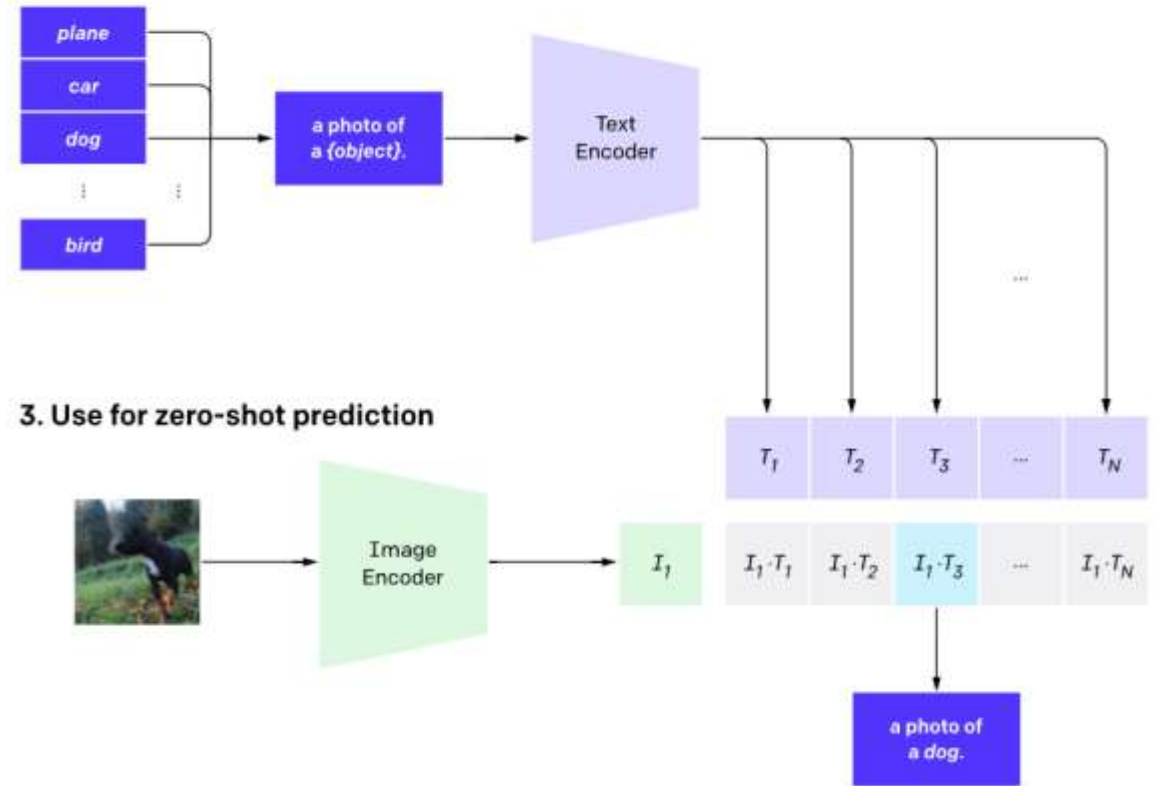


CLIP

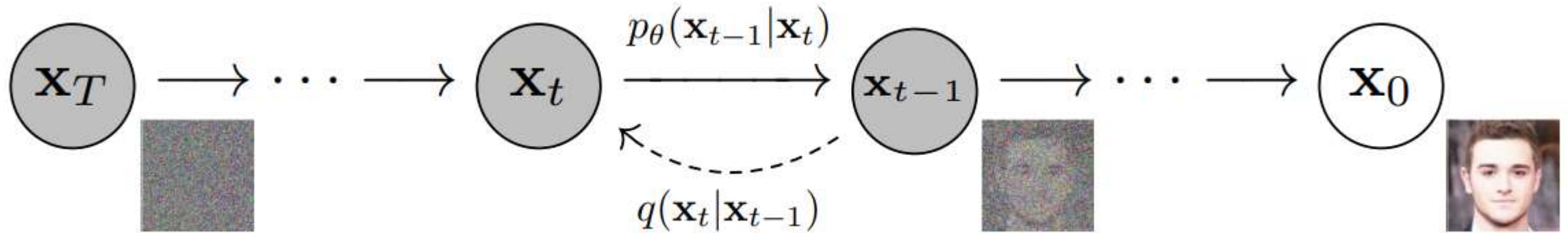
1. Contrastive pre-training



2. Create dataset classifier from label text



Diffusion Models



Stable Diffusion

