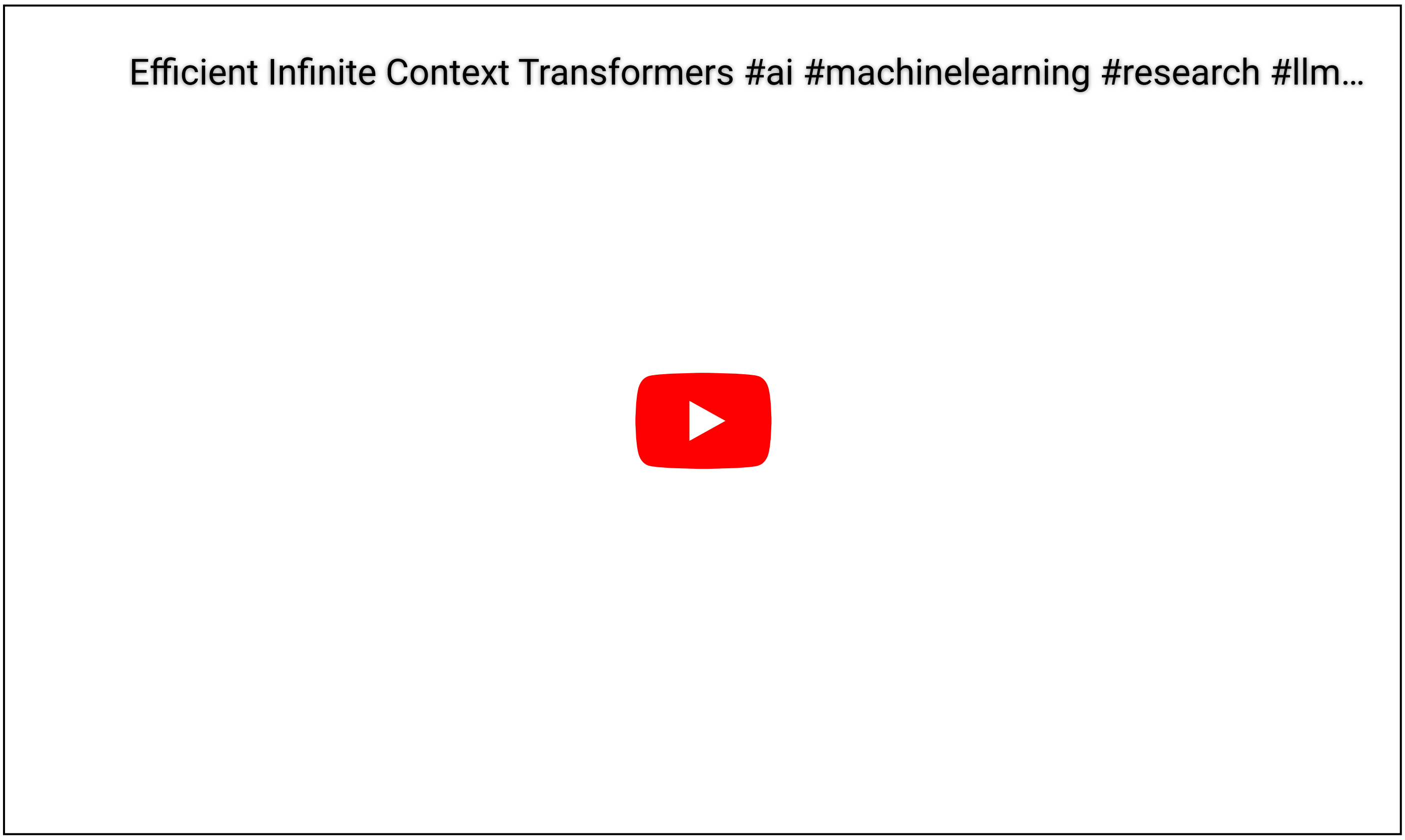
LLM Research Findings > Infini-Attention

Efficient Infinite Context Transformers

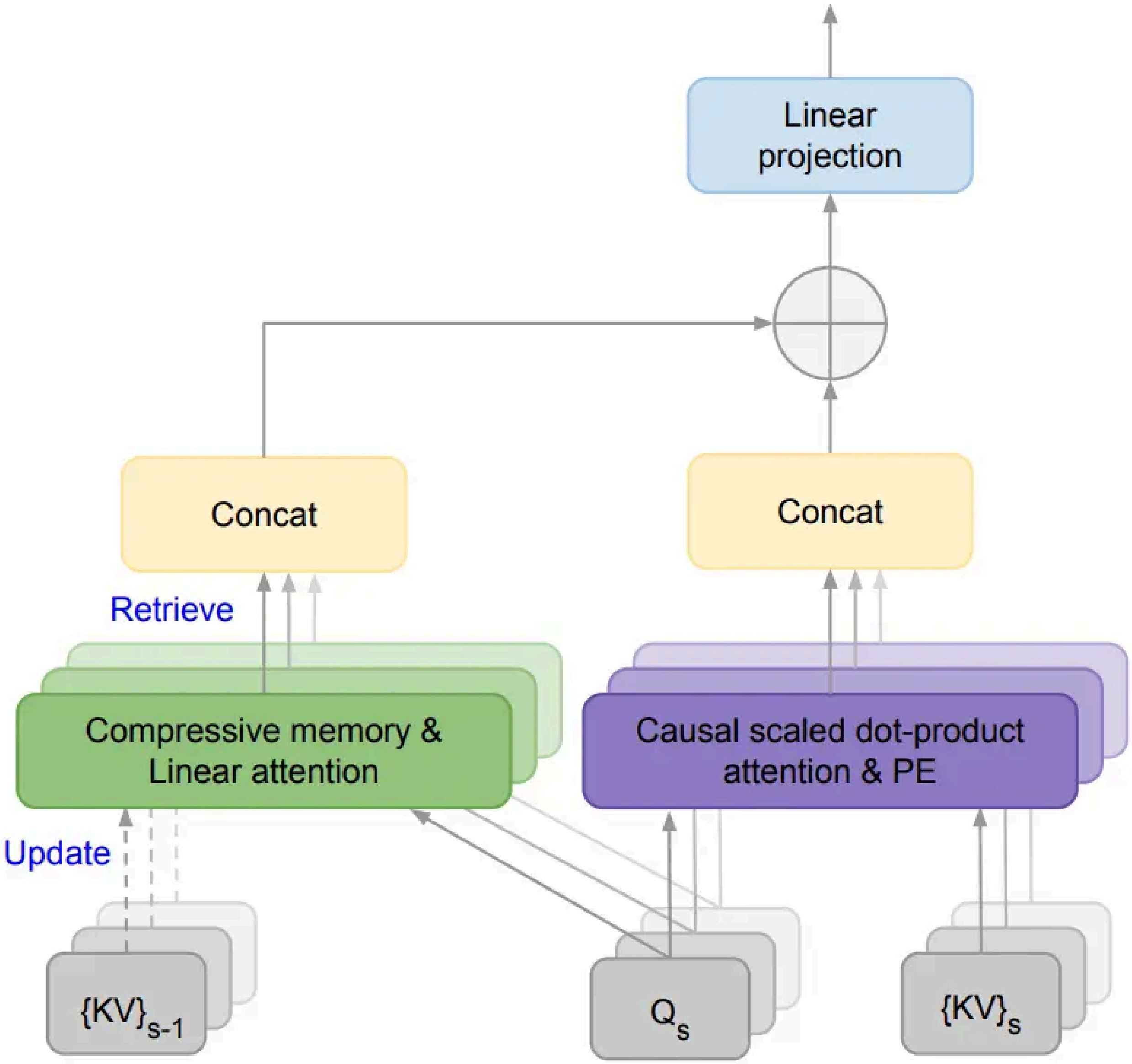


Efficient Infinite Context Transformers #ai #machinelearning #research #llm...

A new paper by Google integrates compressive memory into a vanilla dot-product attention layer.

The goal is to enable Transformer LLMs to effectively process infinitely long inputs with bounded memory footprint and computation.

They propose a new attention technique called Infini-attention which incorporates a compressive memory module into a vanilla attention mechanism.


Linear projection
Concat
Concat
Retrieve
Compressive memory & Linear attention
Causal scaled dot-product attention & PE
Update
{KV}$_{s-1}$
Q$_s$
{KV}$_s$

It builds in both masked local attention and long-term linear attention into a single Transformer block. This allows the Infini-Transformer model to efficiently handle both long and short-range contextual dependencies.

This approach outperforms baseline models on long-context language modeling with a 114x compression ratio of memory!

They also show that a 1B LLM can naturally scale to a 1M sequence length and a 8B model achieves a new SoTA result on a 500K length book summarization task.

Given how important long-context LLMs are becoming having an effective memory system could unlock powerful reasoning, planning, continual adaption, and capabilities not seen before in LLMs.

Last updated on September 19, 2024