1 Introduction

Recurrent neural networks, long short-term memory and gated recurrent neural networks have been firmly established as state of the art approaches in sequence modeling and machine translation. Recent work has achievedsignificant improvements in computational efficiency through factorization tricks. Numerousefforts have since continued to push the boundaries of recurrent language models and encoder-decoderarchitectures. The Transformer allows for significantly more parallelization and can reach a new state of the art intranslation quality after being trained for as little as twelve hours on eight P100 GPUs. The model architecture eschewing recurrence and insteadrelying entirely on an attention mechanism to draw global dependencies between input and output.

2 Background

Self-attention is an attention mechanism relating different positions of a single sequence in order to compute a representation of the sequence. In the Transformer this is reduced to a constant number of operations, albeit at the cost of reduced effective resolution. We counteract this effect with Multi-Head Attention asdescribed in section 3.2. CNN.com will feature iReporter photos in a weekly Travel Snapshots gallery. Please submit your best shots of the U.S. for next week. Visit CNN.com/Travel next Wednesday for a new gallery of snapshots. For the latest, go to CNN iReport.com.

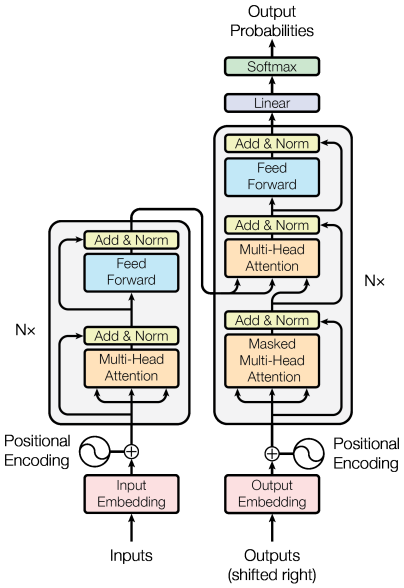

Figure 1

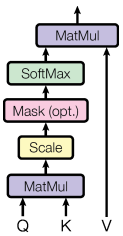

Figure 2

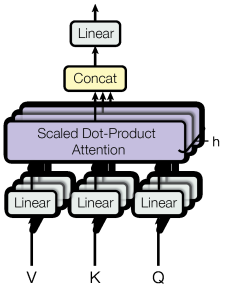
Linear
Concat
Scaled Dot-Product
Attention
h
Linear
Linear
Linear
V
K
Q

Figure 3