

Attention model

Tamás Grósz ¹

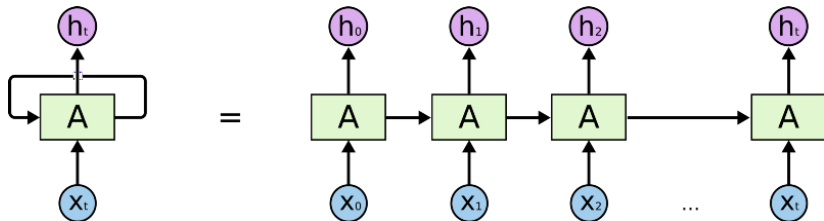
¹forrás: <https://towardsdatascience.com/intuitive-understanding-of-attention-mechanism-in-deep-learning-6c9482aecf4f>

Seq2Seq feladat

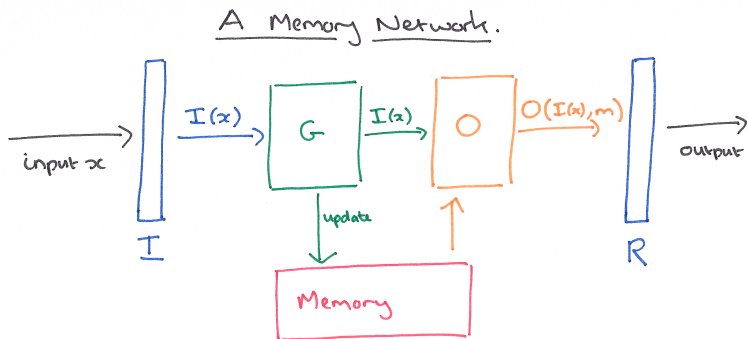
- A bemenet és a kimenet is szekvencia (különböző hosszúságúak lehetnek)
- Standard model: Encoder-Decoder architektúra
- Encoder: fix hosszú látens vektor előállítása a bemenetből
- Decoder: kimenet generálása a látens reprezentáció alapján
- Sokáig (még ma is) RNN (LSTM/GRU) rétegekből állt mindkettő

Mi a gond az RNN-el?

- Fix hosszúságú látens vektor: hosszú szekvencia esetén nem tudunk minden infót betömöríteni.
- Az RNN se biztos, hogy tud emlékezni "régi" eseményekre.



Memory Network



<https://>

Memory Network

I: (input feature map) – converts the incoming input to the internal feature representation.

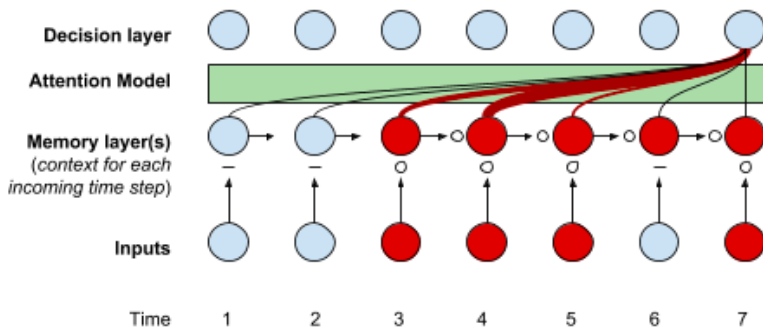
G: (generalization) – updates old memories given the new input. We call this generalization as there is an opportunity for the network to compress and generalize its memories at this stage for some intended future use.

O: (output feature map) – produces a new output (in the feature representation space), given the new input and the current memory state.

R: (response) – converts the output into the response format desired. For example, a textual response or an action.

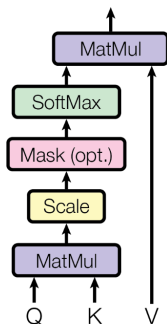
Attention Model

Attention Mechanism



Transformer Model²

Scaled Dot-Product Attention



Q: query, $W_q * h_t$

K: key, $W_k * h_t$

V: value, $W_v * h_t$

$$Att(Q, K, V) = softmax(\frac{QK^T}{\sqrt{d_k}})V$$

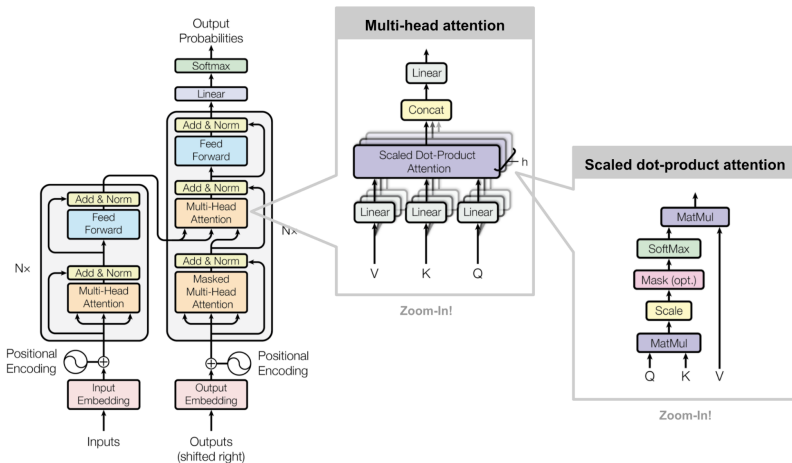
(létezik additive attention is)

Keras kód:

```
layer = AttentionLayer(name='attentionLayer')([encoderout, decoderout])
```

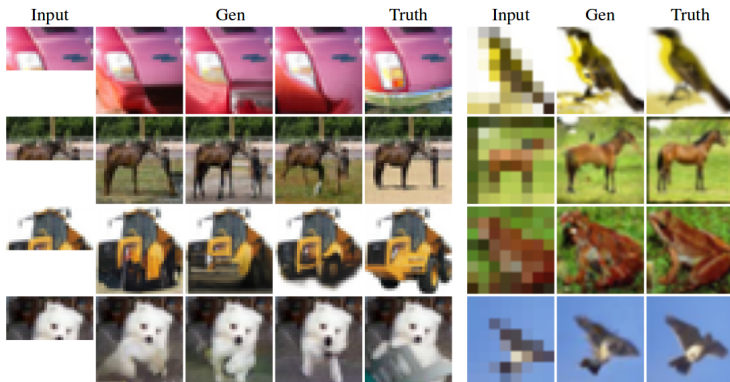
²<http://papers.nips.cc/paper/7181-attention-is-all-you-need.pdf>

Attention Model



Képfeldolgozás 1

<https://arxiv.org/abs/1802.05751>

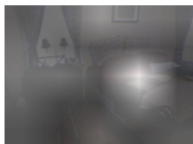
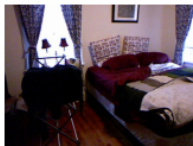


Képfeldolgozás 2

<https://arxiv.org/abs/1511.05960>



Q: What is at the left of the table in the image?
A: Chair



Q: What color are the bed sheets in the image?
A: Red



Q: What is the color of the cake?
A: White



Q: What are standing next to the flower pot?
A: Dogs

Fordítás

