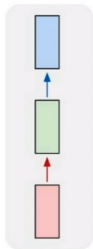


NLP

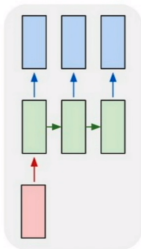
Wydział Biochemii, Biofizyki i Biotechnologii
Adrian Kania

Modelowanie sekwencji

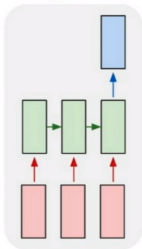
one to one



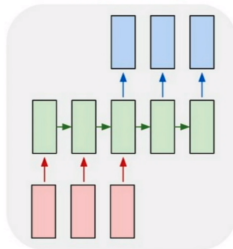
one to many



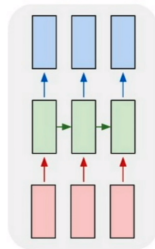
many to one



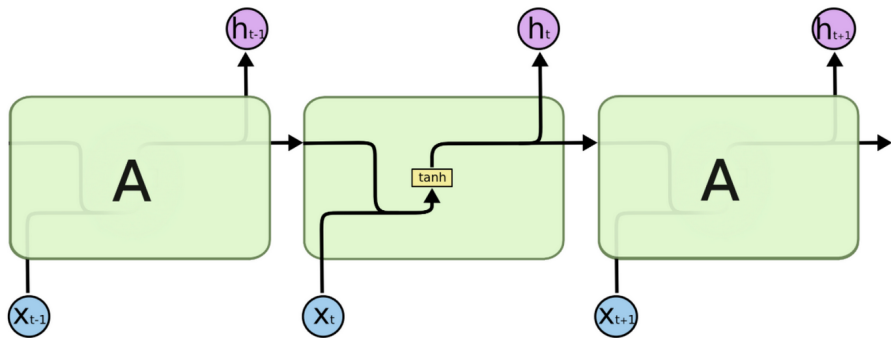
many to many

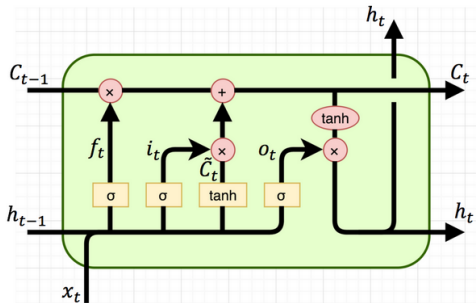


many to many

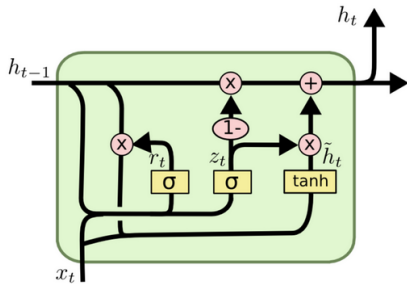


RNN

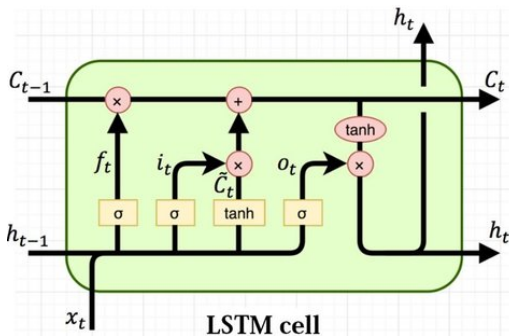




(a) Long Short-Term Memory



(b) Gated Recurrent Unit



$$i_t = \sigma(x_t U^i + h_{t-1} W^i)$$

$$f_t = \sigma(x_t U^f + h_{t-1} W^f)$$

$$o_t = \sigma(x_t U^o + h_{t-1} W^o)$$

$$\tilde{C}_t = \tanh(x_t U^g + h_{t-1} W^g)$$

$$C_t = \sigma(f_t * C_{t-1} + i_t * \tilde{C}_t)$$

$$h_t = \tanh(C_t) * o_t$$