LSTM

$$\mathrm{i}_t = sigm(\boldsymbol{w}_{xi}x_t + \boldsymbol{w}_{hi}h_{t-1} + b_i)$$

$$f_t = sigm(\boldsymbol{w}_{xf}x_t + \boldsymbol{w}_{hi}h_{t-1} + b_f)$$

$$o_t = sigm(\boldsymbol{w}_{xo}x_t + \boldsymbol{w}_{ho}h_{t-1} + b_o)$$

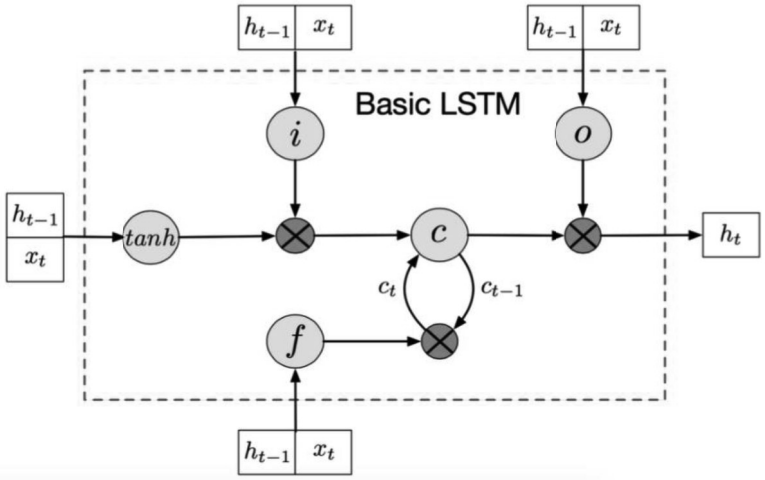
$$g_t = \tanh(\boldsymbol{w}_{xg}x_t + \boldsymbol{w}_{hg}h_{t-1} + b_g)$$

$$c_t = f_t \odot c_{t-1} + i_t \odot g_t$$

$$h_t = o_t \odot \tanh(c_t)$$

$$\tanh(x) = \frac{1-\exp(-2x)}{1+\exp(-2x)}$$

双曲正切



$$\begin{pmatrix} x_1 \\ x_2 \end{pmatrix} \odot \begin{pmatrix} y_1 \\ y_2 \end{pmatrix} = \begin{pmatrix} x_1 y_1 \\ x_2 y_2 \end{pmatrix}$$