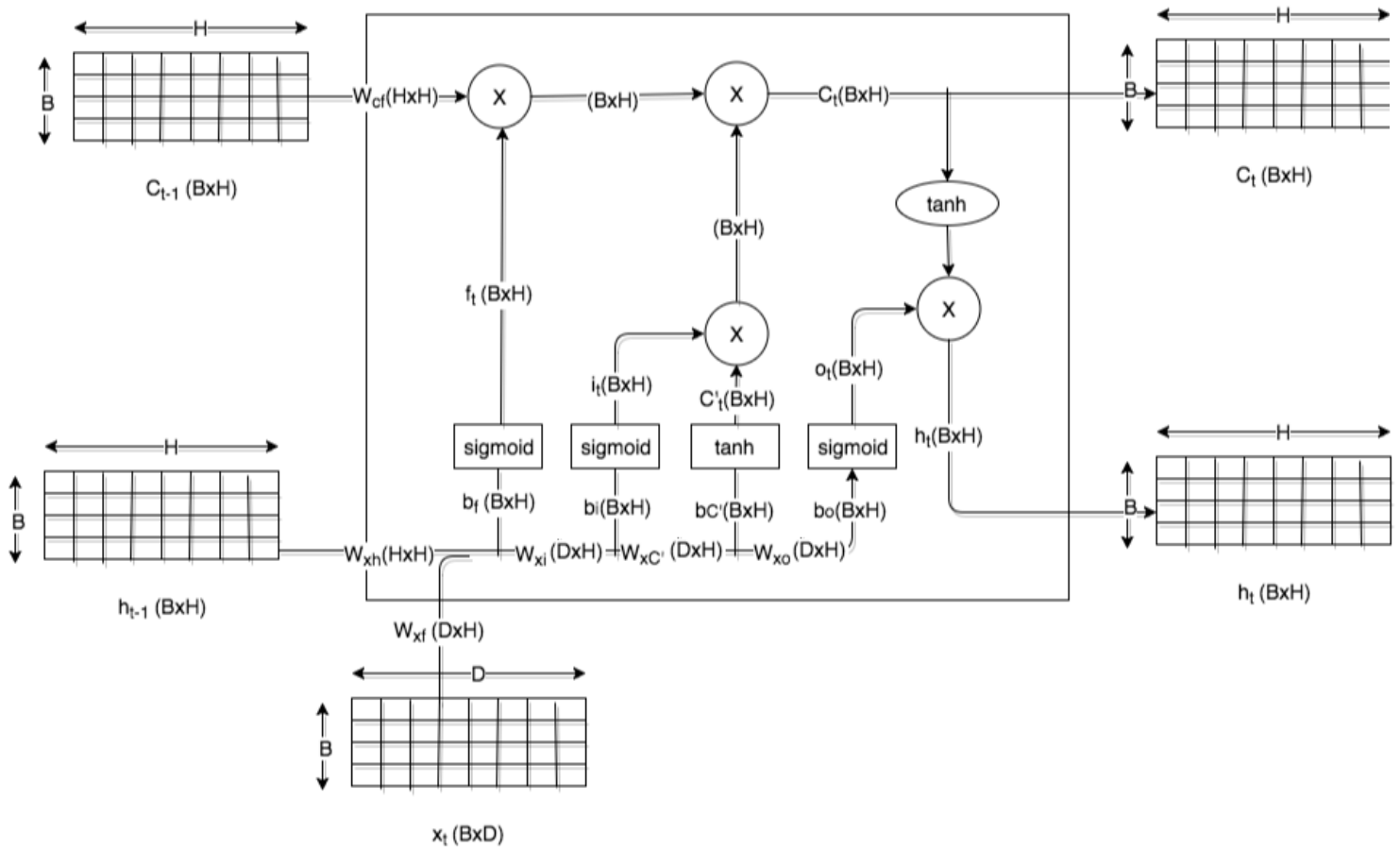

$$W_{xc} \rightarrow R^D \times R^H \qquad W_{hc} \rightarrow R^H \times R^H$$

$$i_t = \sigma\left(W_{xi}x_t + W_{hi}h_{t-1} + W_{ci}c_{t-1} + b_i\right)$$
$$f_t = \sigma\left(W_{xf}x_t + W_{hf}h_{t-1} + W_{cf}c_{t-1} + b_f\right)$$
$$c_t = f_t c_{t-1} + i_t \tanh\left(W_{xc}x_t + W_{hc}h_{t-1} + b_c\right)$$
$$o_t = \sigma\left(W_{xo}x_t + W_{ho}h_{t-1} + W_{co}c_t + b_o\right)$$
$$h_t = o_t \tanh(c_t)$$

$i_t \in \mathbb{R}^B \times \mathbb{R}^H$

$f_t \in \mathbb{R}^B \times \mathbb{R}^H$

$c_t \in \mathbb{R}^B \times \mathbb{R}^H$

$o_t \in \mathbb{R}^B \times \mathbb{R}^H$

$h_t \in \mathbb{R}^B \times \mathbb{R}^H$

$x_t \in \mathbb{R}^B \times \mathbb{R}^D$

$h_{t-1} \in \mathbb{R}^B \times \mathbb{R}^H$

$c_{t-1} \in \mathbb{R}^B \times \mathbb{R}^H$

$W_{xi} \in \mathbb{R}^D \times \mathbb{R}^H$

$W_{xf} \in \mathbb{R}^D \times \mathbb{R}^H$

$W_{xo} \in \mathbb{R}^D \times \mathbb{R}^H$

$W_{hi} \in \mathbb{R}^H \times \mathbb{R}^H$

$W_{hf} \in \mathbb{R}^H \times \mathbb{R}^H$

$W_{ho} \in \mathbb{R}^H \times \mathbb{R}^H$

$b_i \in \mathbb{R}^B \times \mathbb{R}^H$

$b_f \in \mathbb{R}^B \times \mathbb{R}^H$

$b_c \in \mathbb{R}^B \times \mathbb{R}^H$

$b_o \in \mathbb{R}^B \times \mathbb{R}^H$