Assignment 3

Wednesday, May 9, 2018 17:19

$\tanh(x) = (e^x - e^{-x})(e^x + e^{-x})^{-1}$

$f'(x) = (e^x + e^{-x})(e^x + e^{-x})^{-1} - (e^x + e^{-x})^{-2} \cdot (e^x + e^{-x})(e^x - e^{-x})$

$= 1 - \frac{e^x - e^{-x}}{(e^x + e^{-x})} = 1 - f(x)$?

$\left(\frac{e^x - e^{-x}}{e^x + e^{-x}}\right)' = \frac{(e^x + e^{-x})^2 - (e^x - e^{-x})(e^x - e^{-x})}{(e^x + e^{-x})^2} = 1 - \left(\frac{e^x - e^{-x}}{e^x + e^{-x}}\right)^2$

$= 1 - f^2(x)$

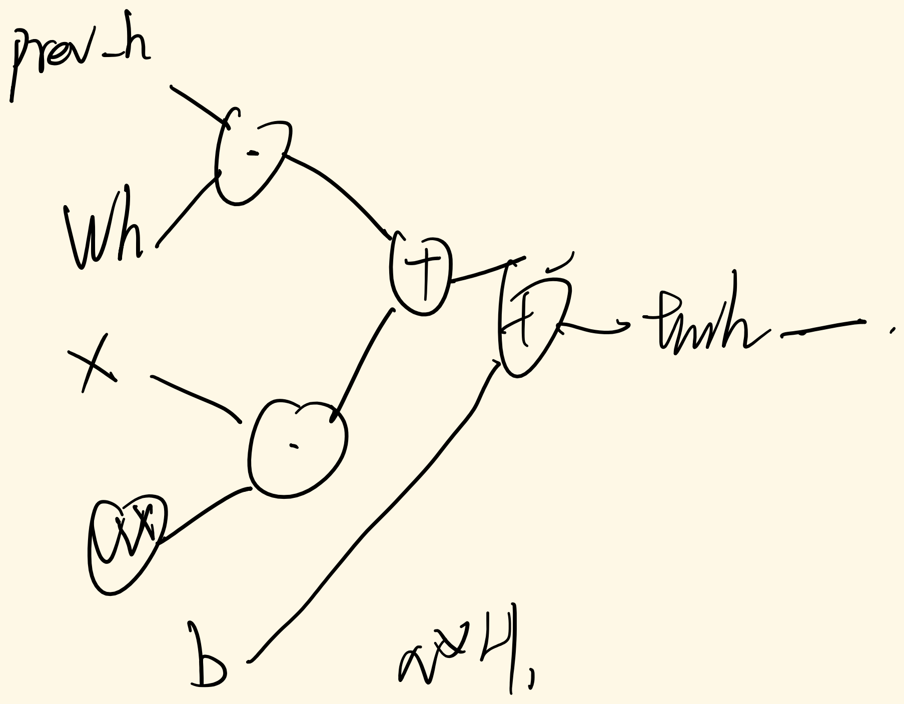
x: N×D

prev_h = N×H

Wx = D×H

Wh = H×H

b = H×1



N×H

H×N × N×H

$\frac{d \times N}{H \times N \; N \times H}$

$\frac{d(W^T x)}{dx} = W^T$

D×C N×D / D×N D×N

N×D

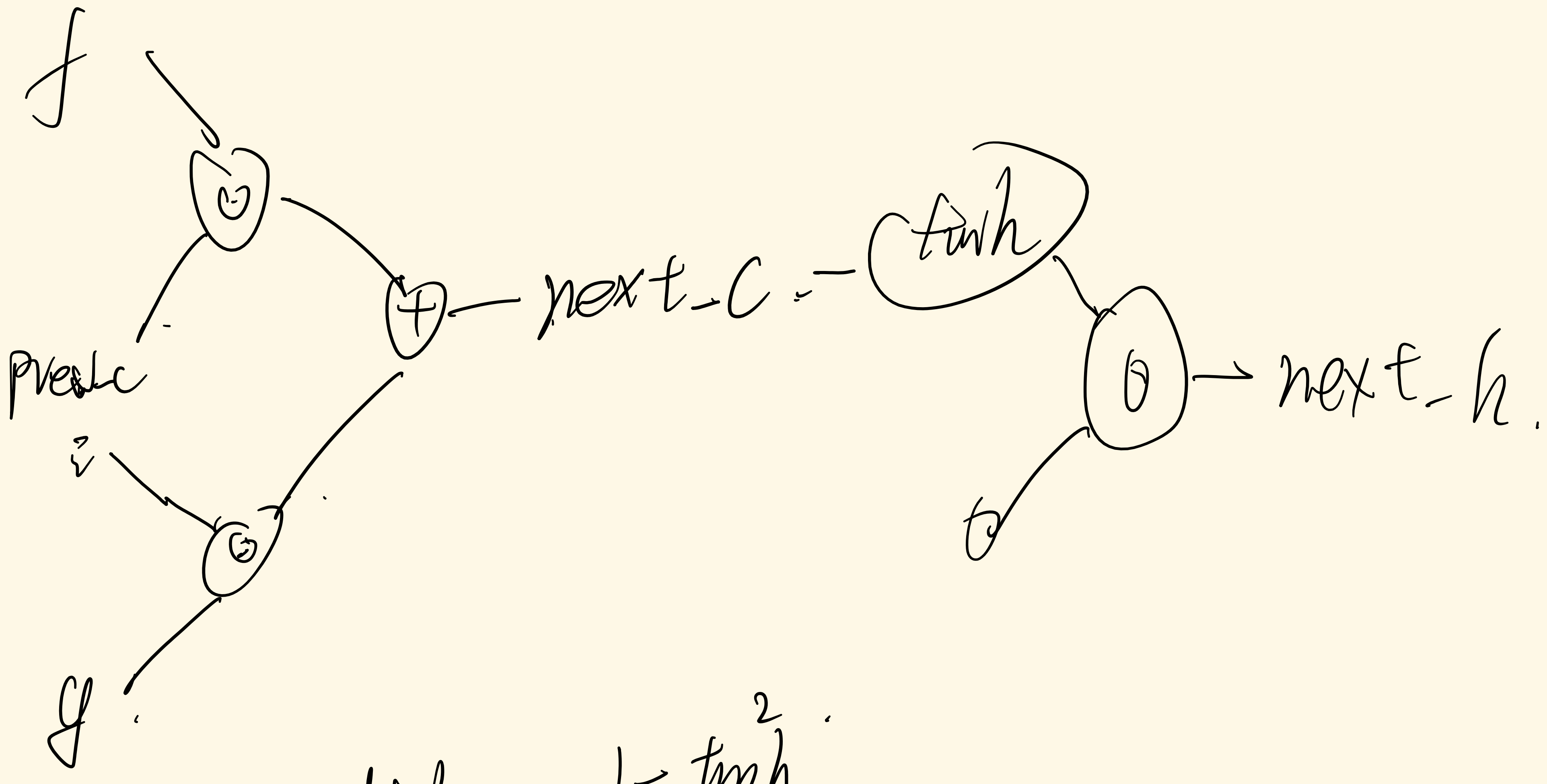
x·W N×D × D×H

N×C × C×D

W^T

$a \in R^{N \times H}$ N×H ×

N×H



$d\tanh = 1 - \tanh^2$

$\frac{d\left(\frac{1}{1+e^{-x}}\right)}{dx} = (1+e^{-x})^{-1\,'} = -(1+e^{-x})^{-2}$

$\frac{e^{-x}}{(1+e^{-x})^2}$

$f(1-f)$

$\sigma'(i) = (1-\sigma(i))$