Equations for Writing Project

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Recurrent Neural Networks

$$y_1 = \sigma[w_1 \cdot x_1 + b_1] \cdot w_2 + b_2$$

$$y_2 = \sigma[w_1 \cdot x_2 + w_3 \cdot \sigma[w_1 \cdot x_1 + b_1] + b_1] \cdot w_2 + b_2$$

$$y_3 = \sigma[w_1 \cdot x_3 + w_3 \cdot \sigma[w_1 \cdot x_2 + w_3 \cdot \sigma[w_1 \cdot x_1 + b_1] + b_1] + b_1] \cdot w_2 + b_2$$

Long Short-Term Memory Networks

Forget Gate

$$f_t = \sigma[W_f(h_{t-1}, x_t) + b_f]$$

Input Gate

$$i_t = \sigma[W_i(h_{t-1}, x_t) + b_i]$$

New Candidate Values

$$\tilde{C}_t = tanh[W_c(h_{t-1}, x_t) + b_c]$$

New Cell State

$$C_t = f_t \cdot C_{t-1} + \tilde{C}_t$$

Output Gate

$$o_t = \sigma[W_o(h_{t-1}, x_t) + b_o]$$

Output Value

$$h_t = o_t \cdot tanh[C_t]$$