卷积推导

Log Creative

$$
\begin{aligned}
\mathbf{I}_{N\times C_{\text{in}}\times H\times W} & \\
\mathbf{W}_{C_{\text{out}}\times C_{\text{in}}\times a_0\times a_1} & \\
\mathbf{B}_{C_{\text{out}}} & \\
\mathbf{O}_{N\times C_{\text{out}}\times H_{\text{out}}\times W_{\text{out}}} &= \texttt{F.conv2d}(\mathbf{I},\mathbf{W},\mathbf{B}) \\
\mathbf{O}_{i,j} &= \mathbf{B}_j + \sum_{k=0}^{C_{\text{in}}-1} \mathbf{W}_{j,k} * \mathbf{I}_{i,k} \\
\delta_{i,k}^{\text{in}} &= \delta_{i,j}^{\text{out}} * \mathbf{W}_{j,k}^{rot180} \\
\delta_w &= \mathbf{I} * \delta^{\text{out}} \\
\delta_b &= \delta^{\text{out}}
\end{aligned}
$$