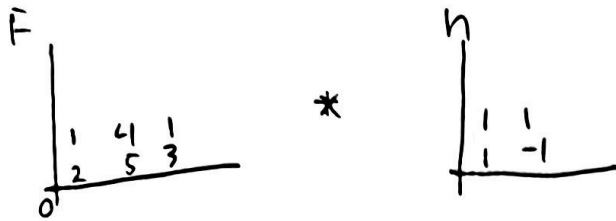


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Pemrosesan Sinyal & Optimisasi - D



$$G(n_1, n_2) = \sum_{i=-\infty}^{\infty} \sum_{j=-\infty}^{\infty} F(n_1, n_2) h(i - n_1, j - n_2)$$

kernel dicerminkan thdp 0 sehingga:

$$\begin{bmatrix} -1 & 1 \\ 1 & 1 \end{bmatrix}$$

→ sliding; dot product

$$(1,1) \begin{bmatrix} 0 & 0 \\ 0 & 1 \end{bmatrix} \begin{matrix} 4 & 1 \\ 0 & 2 & 5 & 3 \\ 0 & 0 \end{matrix} * \begin{bmatrix} -1 & 1 \\ 1 & 1 \end{bmatrix} = 1$$

$$(1,2) \begin{bmatrix} 0 & 0 \\ 1 & 4 \end{bmatrix} \begin{matrix} 1 \\ 2 & 5 & 3 \\ 0 & 0 \end{matrix} * \begin{bmatrix} -1 & 1 \\ 1 & 1 \end{bmatrix} = 5$$

$$(1,3) \begin{bmatrix} 0 & 0 \\ 4 & 1 \end{bmatrix} \begin{matrix} 1 \\ 2 & 5 & 3 \\ 0 & 0 \end{matrix} * \begin{bmatrix} -1 & 1 \\ 1 & 1 \end{bmatrix} = 5$$

$$(1,4) \begin{bmatrix} 0 & 0 \\ 1 & 0 \end{bmatrix} \begin{matrix} 1 \\ 2 & 5 & 3 \\ 0 & 0 \end{matrix} * \begin{bmatrix} -1 & 1 \\ 1 & 1 \end{bmatrix} = 1$$

$$(2,1) \begin{array}{|c|c|} \hline 0 & 1 \\ \hline 0 & 2 \\ \hline \end{array} \begin{array}{cc} 4 & 1 \\ 5 & 3 \end{array} \star \begin{array}{|c|c|} \hline -1 & 1 \\ \hline 1 & 1 \\ \hline \end{array} = 3$$

$$(2,2) \begin{array}{|c|c|} \hline 1 & 4 \\ \hline 2 & 5 \\ \hline \end{array} \begin{array}{cc} 1 & \\ 3 & \end{array} \star \begin{array}{|c|c|} \hline -1 & 1 \\ \hline 1 & 1 \\ \hline \end{array} = 10$$

$$(2,3) \begin{array}{c} 1 \\ 2 \end{array} \begin{array}{|c|c|} \hline 4 & 1 \\ \hline 5 & 3 \\ \hline \end{array} \star \begin{array}{|c|c|} \hline -1 & 1 \\ \hline 1 & 1 \\ \hline \end{array} = 5$$

$$(2,4) \begin{array}{cc} 1 & 4 \\ 2 & 5 \end{array} \begin{array}{|c|c|} \hline 1 & 0 \\ \hline 3 & 0 \\ \hline \end{array} \star \begin{array}{|c|c|} \hline -1 & 1 \\ \hline 1 & 1 \\ \hline \end{array} = 2$$

$$(3,1) \begin{array}{c} 1 & 4 & 1 \\ \vdots & & \end{array} \begin{array}{|c|c|} \hline 0 & 2 \\ \hline 0 & 0 \\ \hline \end{array} \begin{array}{cc} 5 & 3 \\ \hline \end{array} \star \begin{array}{|c|c|} \hline -1 & 1 \\ \hline 1 & 1 \\ \hline \end{array} = 2$$

$$(3,2) \begin{array}{c} 1 & 4 & 1 \\ \vdots & & \end{array} \begin{array}{|c|c|} \hline 2 & 5 \\ \hline 0 & 0 \\ \hline \end{array} \begin{array}{cc} 3 & \\ \hline \end{array} \star \begin{array}{|c|c|} \hline -1 & 1 \\ \hline 1 & 1 \\ \hline \end{array} = 3$$

$$(3,3) \begin{array}{c} 1 & 4 & 1 \\ \vdots & & \end{array} \begin{array}{|c|c|} \hline 5 & 3 \\ \hline 0 & 0 \\ \hline \end{array} \star \begin{array}{|c|c|} \hline -1 & 1 \\ \hline 1 & 1 \\ \hline \end{array} = -2$$

$(3,4)$

$$\begin{array}{ccc} 1 & 4 & 1 \\ 2 & 5 & 3 \\ \hline & & 0 \end{array} \star \begin{array}{cc} -1 & 1 \\ 1 & 1 \end{array} = -3$$

$$G(n_1, n_2) = \begin{bmatrix} 1 & 5 & 5 & 1 \\ 3 & 10 & 5 & 2 \\ 2 & 3 & -2 & -3 \end{bmatrix}$$