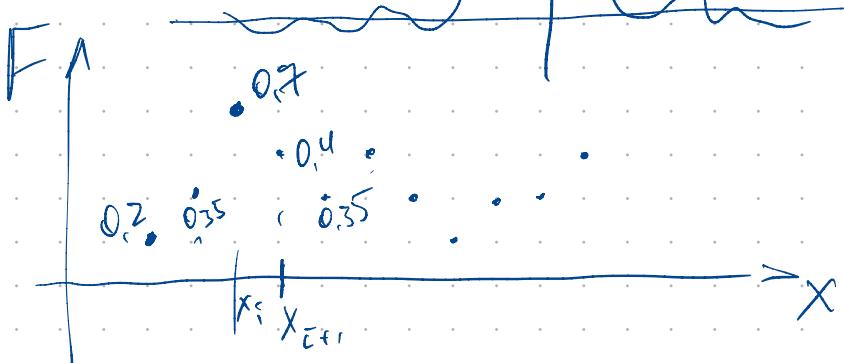
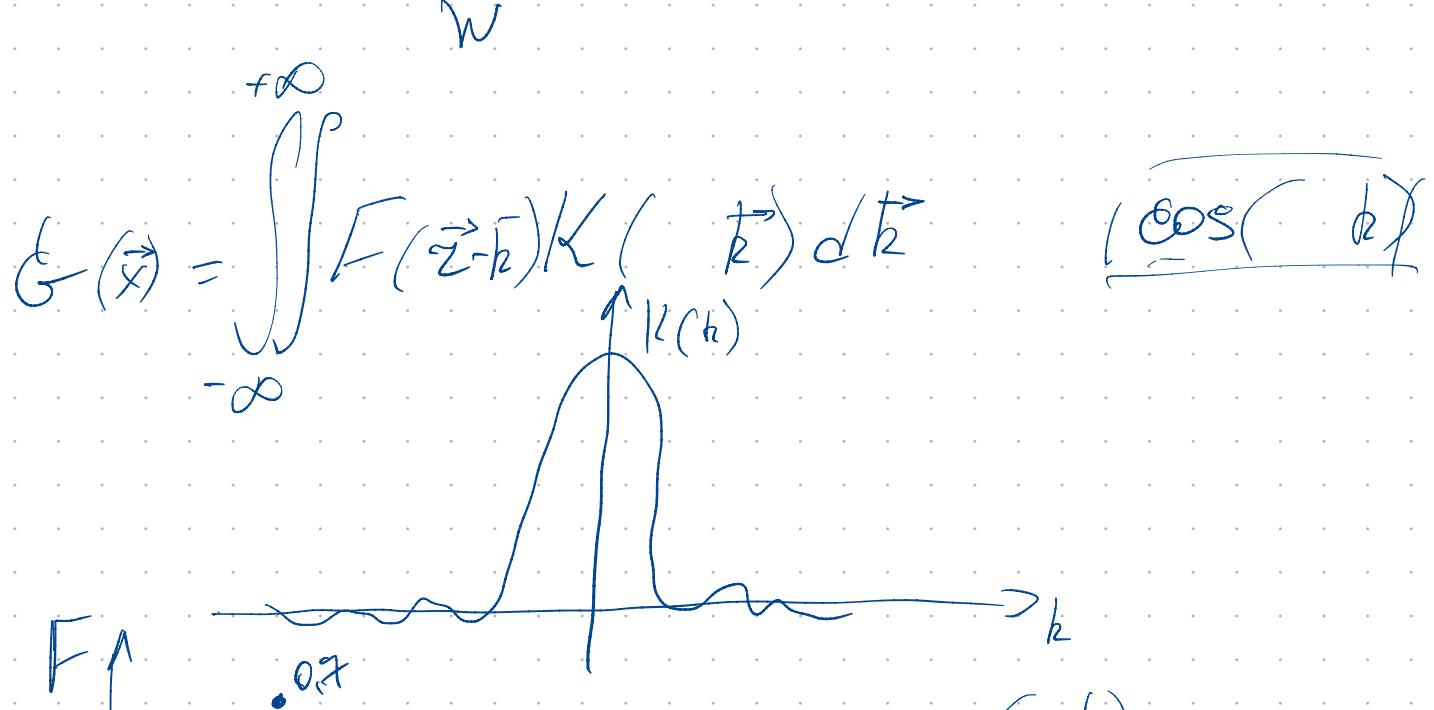


$$H = 550 \quad U$$

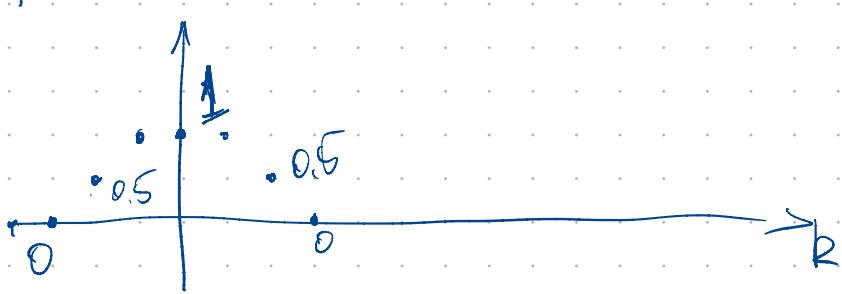
$$W = 550$$

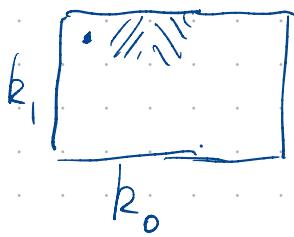
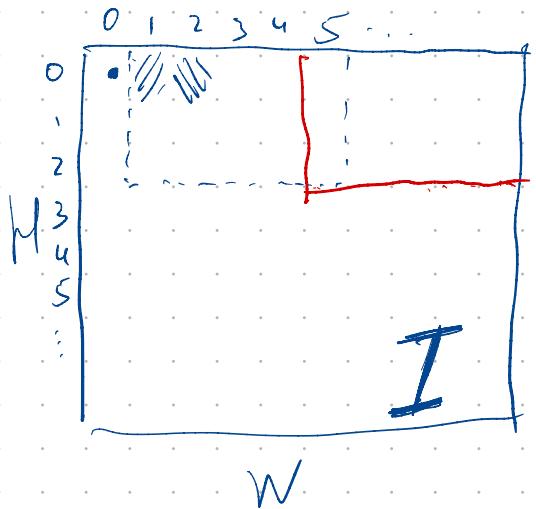


$$(x-k)$$

$$\sum_k F(x-k)K(k)$$

$$G(x_i) = 0,2 \cdot 0,5 + \\ + 0,35 \cdot 1 + \\ + 0,7 \cdot 1 + \\ + 0,4 \cdot 1 + \\ + 0,35 \cdot 0,5$$

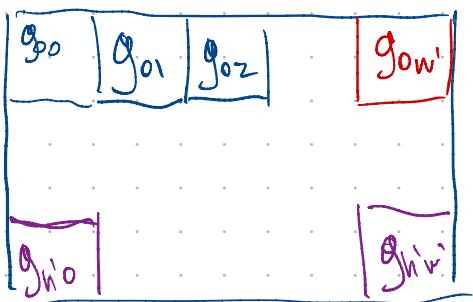




$$f(0,0) = g_{00}$$

$$w' = w - k_0 + 1$$

$$h' = h - k_1 + 1$$



g_{00}

g_{00}

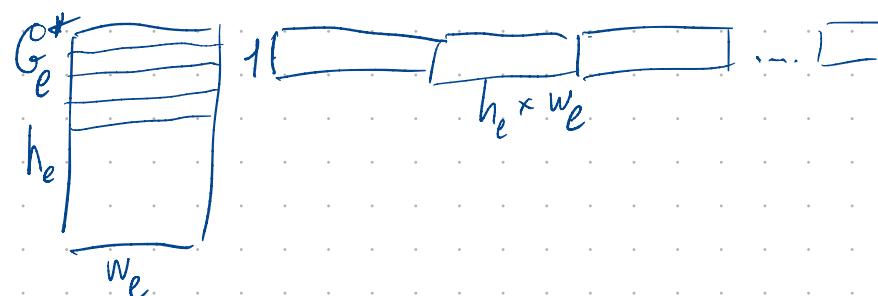
$g_{0w'}$

$g_{h'}$

$$G_1 = \underline{K_1} \circledast I ; G_2 = \underline{K_2} \circledast G_1^* ; G_3 = \underline{K_3} \circledast G_2^*$$

$$\underline{G_1^*} = G(G_1) ; \underline{G_2^*} = G(G_2) ; \underline{G_3^*} = G(G_3)$$

$$G_e^* \in \mathbb{R}^{h_e \times w_e} \Rightarrow G_e^{**}$$



$$G_e^{**} = \text{Flatten}(G_e^*)$$

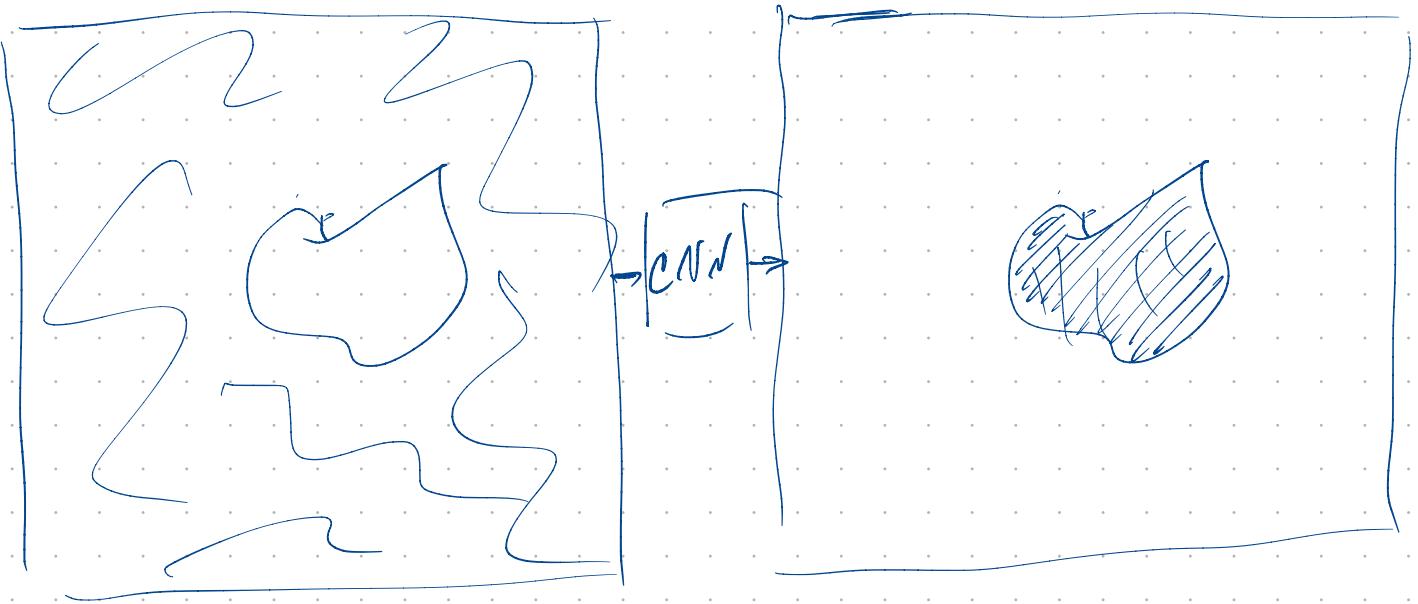
$$z_{l+1} = \Theta_{l+1}^T G_e^{**}$$

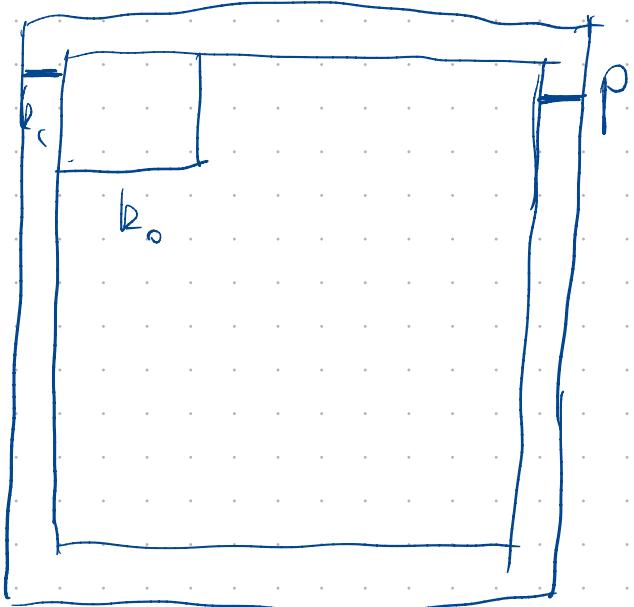
$$z_{l+2} = \Theta_{l+2}^T h_{e+1}$$

$$h_{e+1} = f(z_{l+1})$$

$$h_{e+2} = f(z_{l+2}) \dots$$

$$y = f(z_L)$$



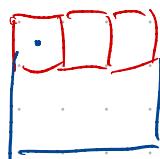
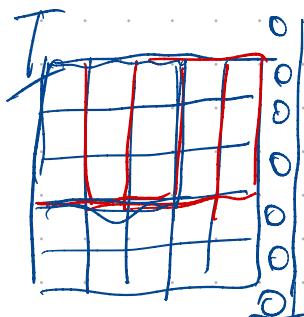


$$W' = \underline{W} - k_0 + l + 2P_0$$

$$\underline{P}_0 = k_0 - 1$$

$$\underline{P}_1 = k_1 - 1$$

$$k=3 \quad p=2$$



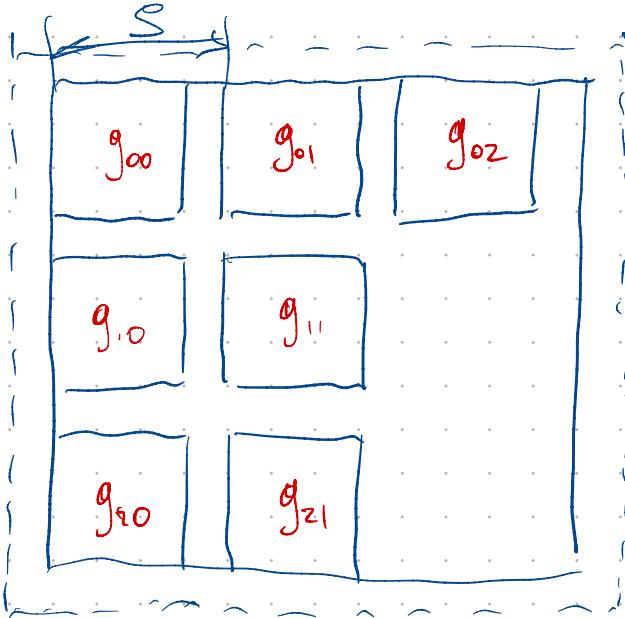
$$g_{ij} = \sum_{k_i, k_j} I(i-k_i, j-k_j) K(k_i, k_j)$$

	2	0	4	
	0	0	0	
I	1	0	0	1
	4	2	2	4
	3	3		

Packing:

- "0"
- Зеркальный
- Улучшенный

8	10	6	10	9	10	
11	12	7	3	2	11	12
13	14	8	5	4	13	14

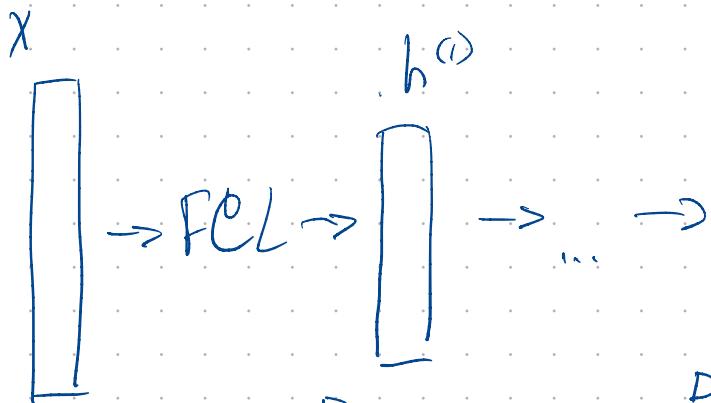


$$S = 4$$

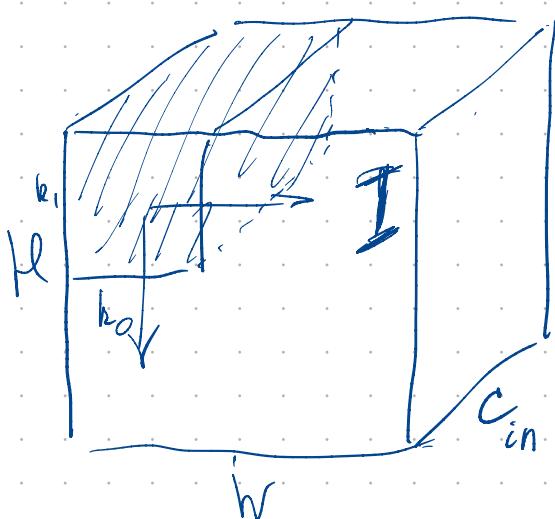
$$P = 1$$

$$W^1 = \left\lceil \frac{W - b + 2P}{S} \right\rceil + 1$$

$$\left\lceil \frac{(2-3+2)}{4} \right\rceil + 1 = 3$$



$$x \in \mathbb{R}^{D_0} \quad h^{(1)} \in \mathbb{R}^{D_1}$$



$$K^0 : k_0 \times k_1 \times c$$

$$G : \left\lceil \frac{W - b_0 + 2P_0}{S_0} \right\rceil + 1 ; \left\lceil \frac{H - h_0 + 2P_0}{S_1} \right\rceil + 1 ; 1$$

$$\left\{ K_1^0, K_2^0, \dots, K_{C_{out}}^0 \right\}$$

$$K^0 : C_{out} \times C_{in} \times W \times H$$