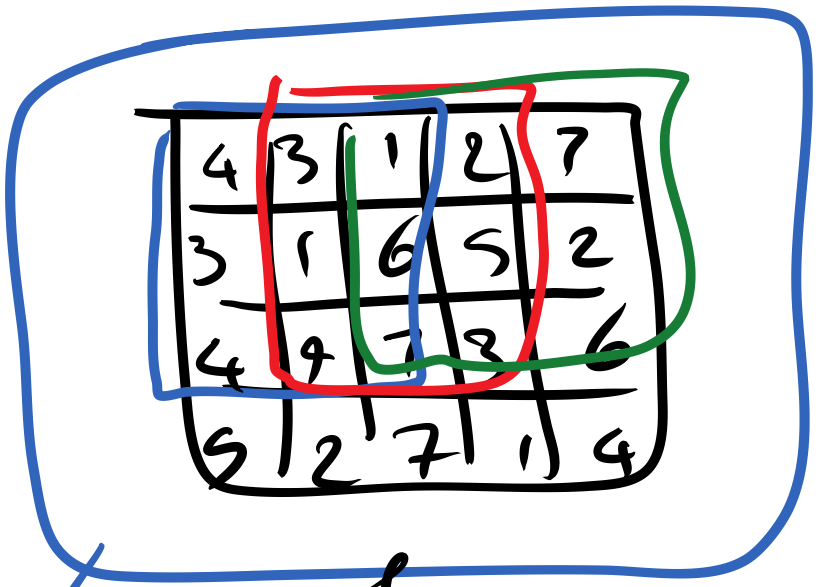
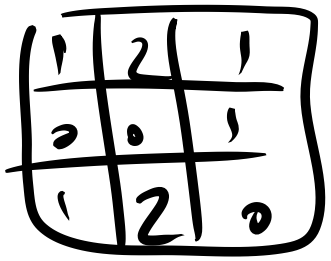
$$f(t) * g(t) = \int_{-\infty}^{\infty} f(\tau)\, g(t-\tau)\, d\tau$$

$$f(x,y) * g(x,y) = \sum\sum f(u,v)\, g(x-u, y-v)$$

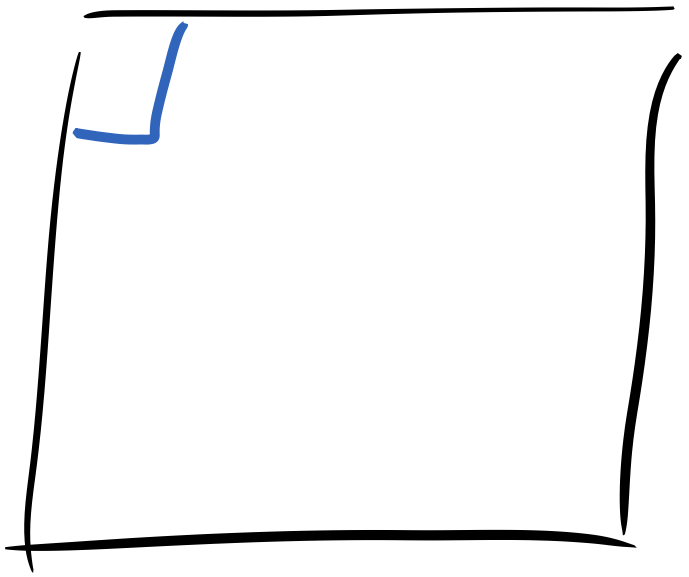


f



g

=



4 x 1 + 2 x 3 + 1 x 1 + 3 x 0 + 1 x 0 + ---

padding

zero padding

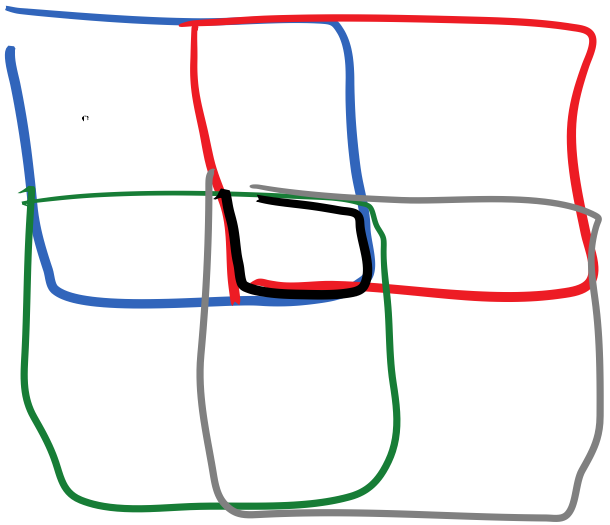
mirror

$f_{m \times n} * g_{3 \times 3} = h_{(m-2) \times (n-2)}$

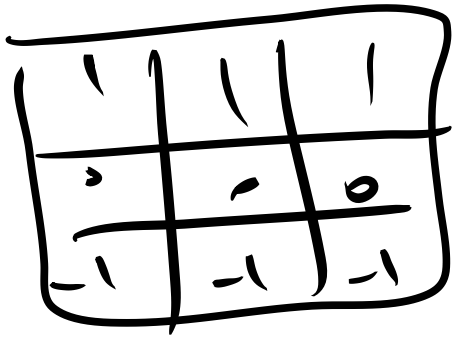
$f_{m \times n} * g_{k \times k} = h_{(m-k+1) \times (n-k+1)}$

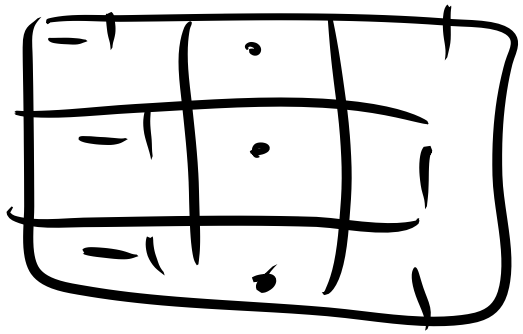
Smoothing

- میانگین
- میانه
- Gaussian
- Kawahara



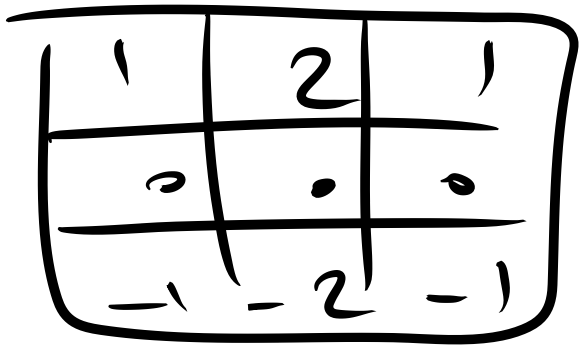
Prewitt



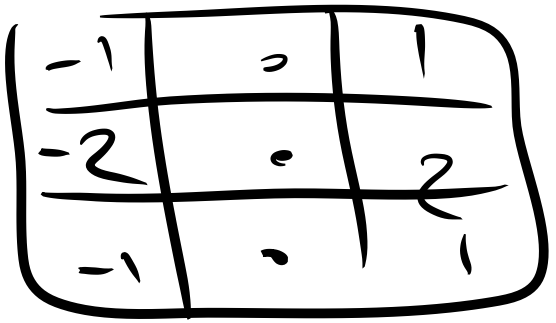


$$\sqrt{p_h^2 + p_v^2} \qquad \vartheta = \operatorname{arctg} \frac{p_v}{p_h}$$

Sobel



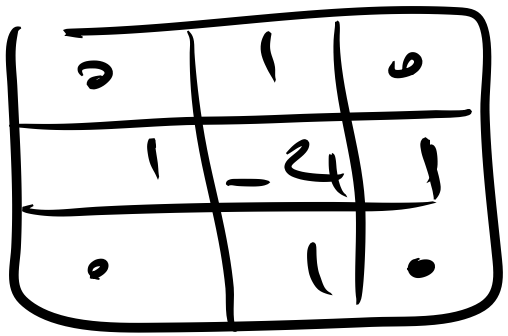
S_h



h_v

Res $\sqrt{S_h^2 + S_v^2}$

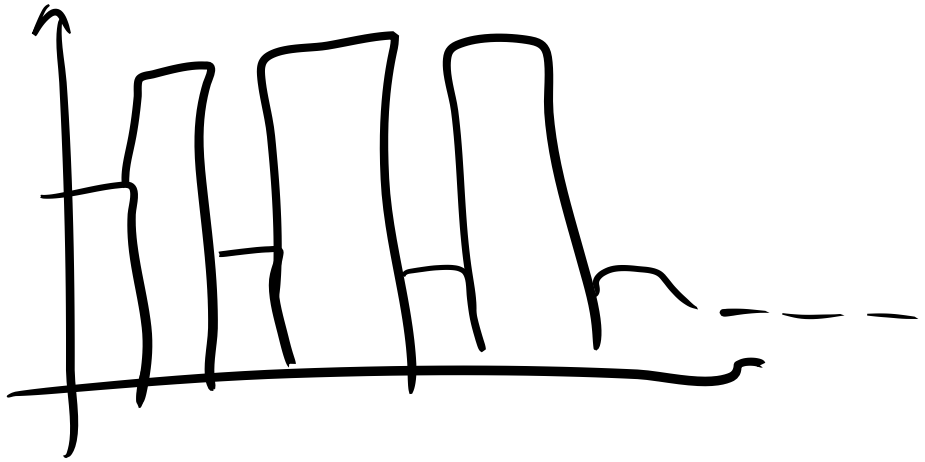
لابلاسر

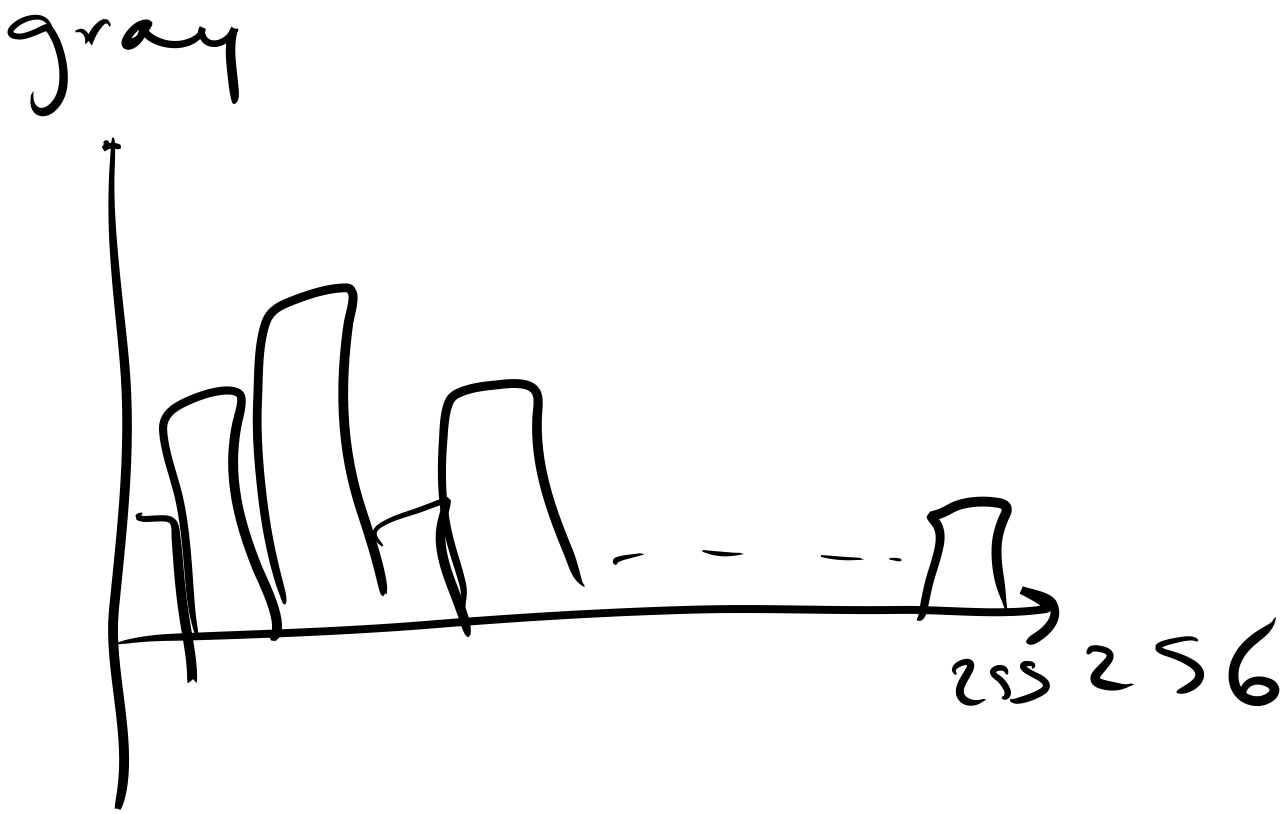


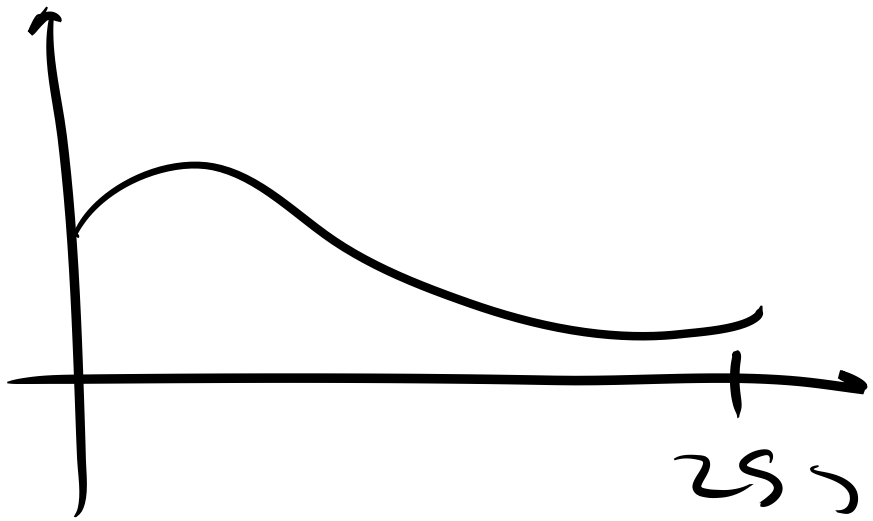
sharp

I +2L

هیستوگرام




gray
255
256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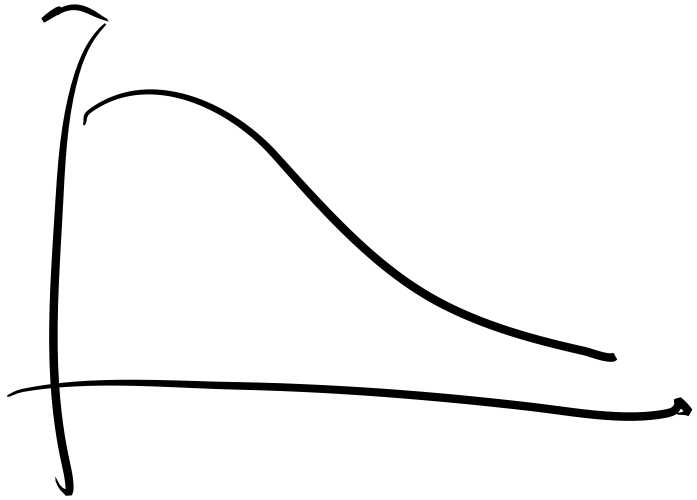

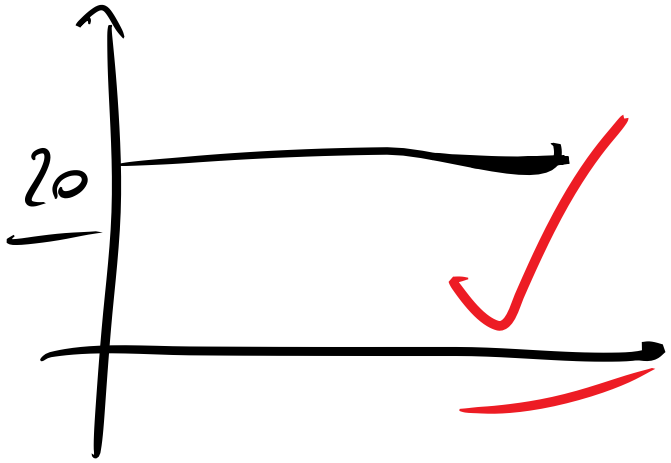
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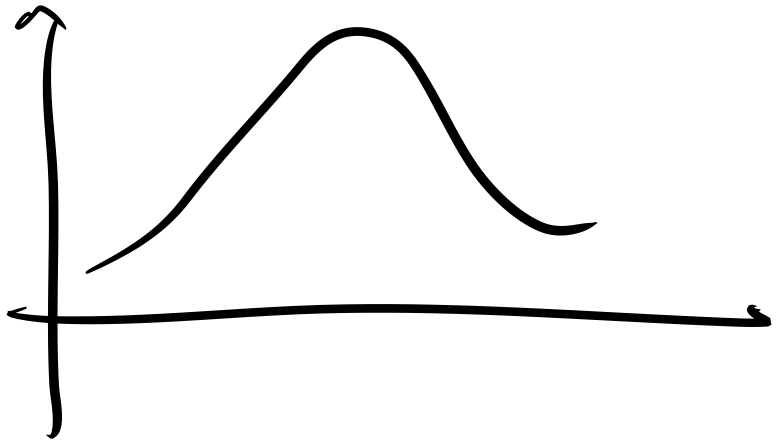

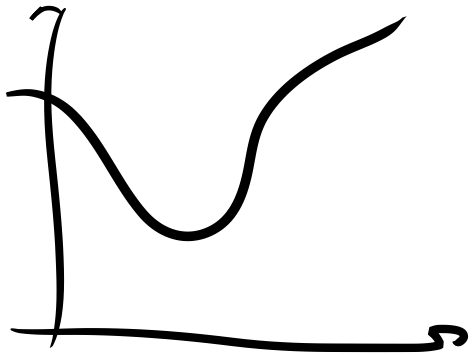

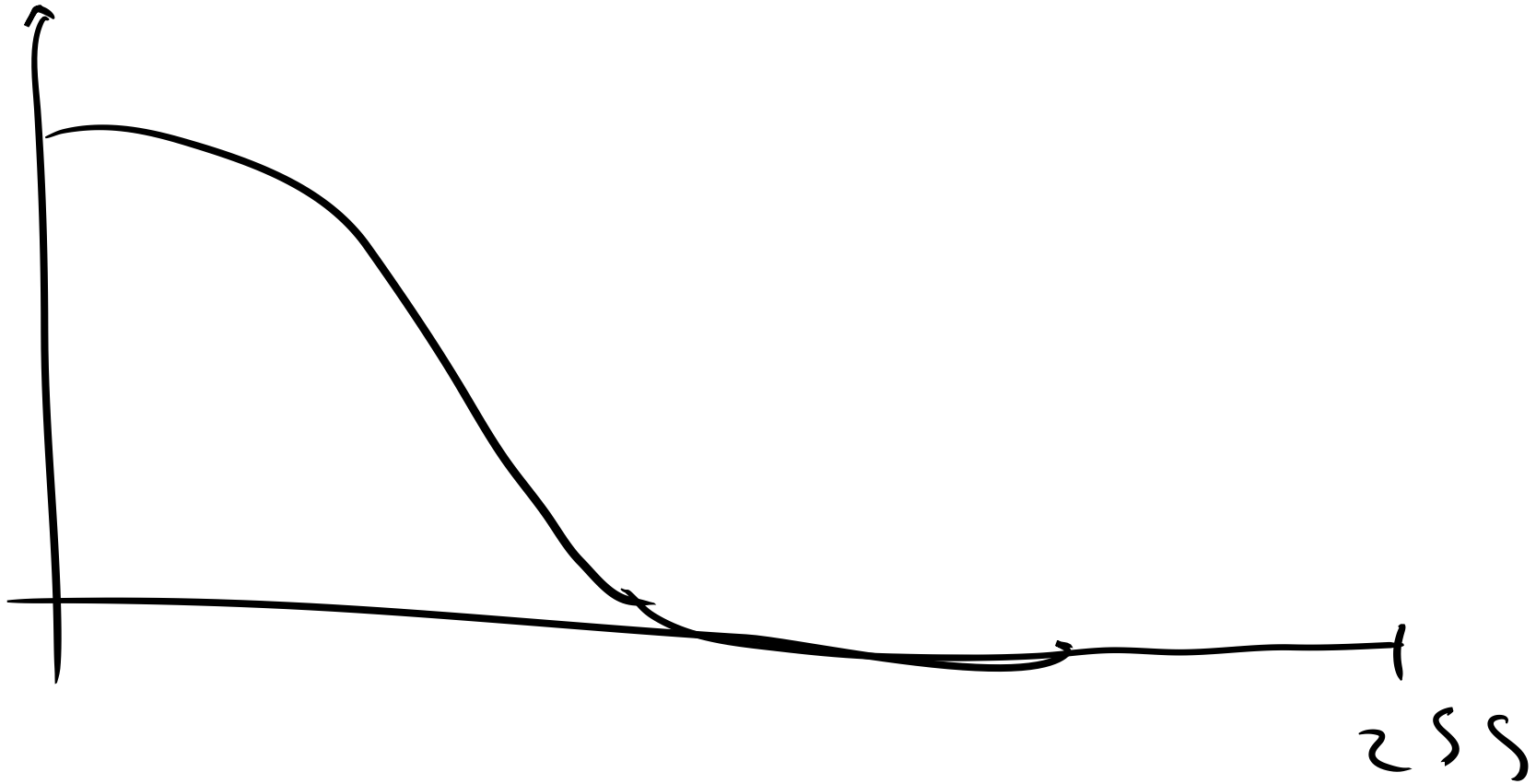
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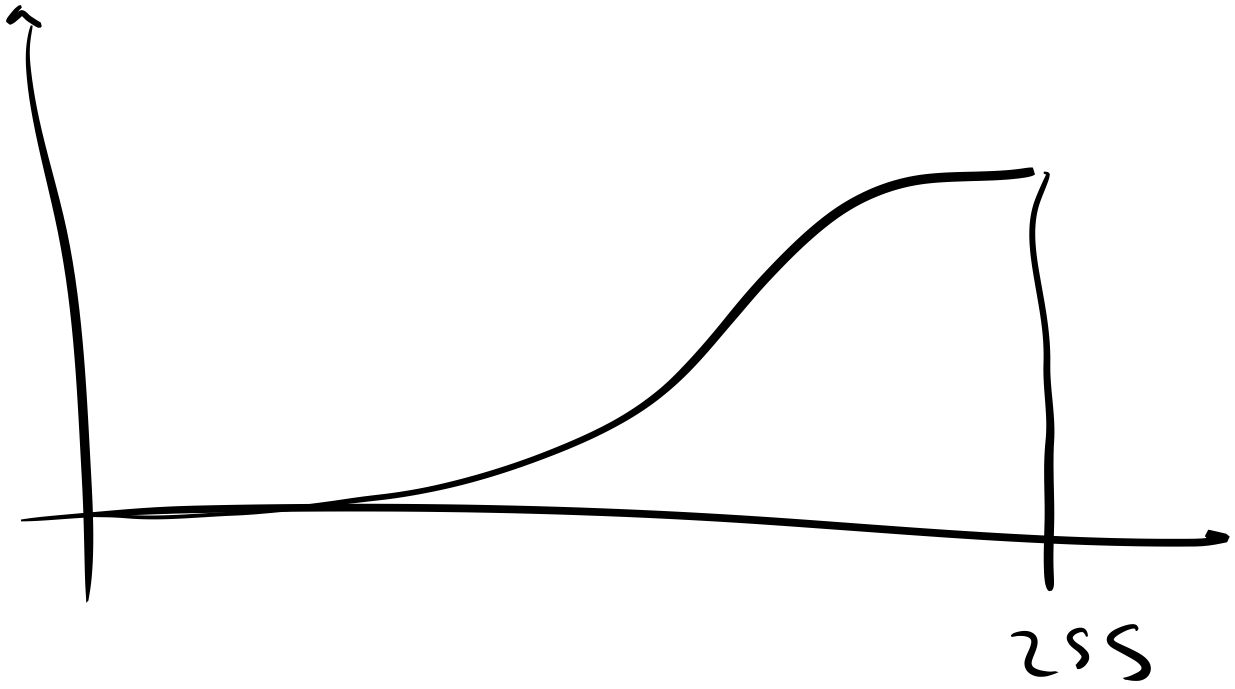
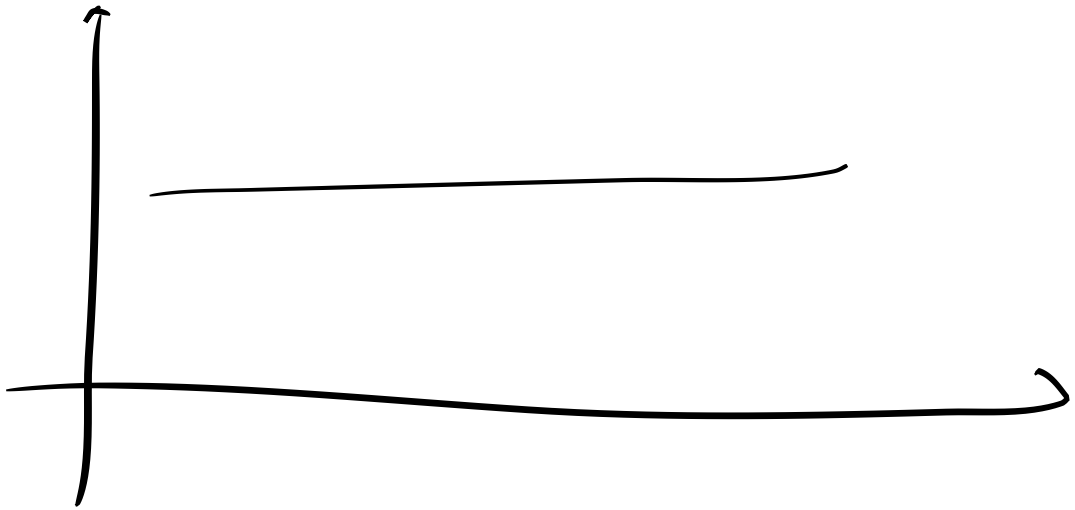
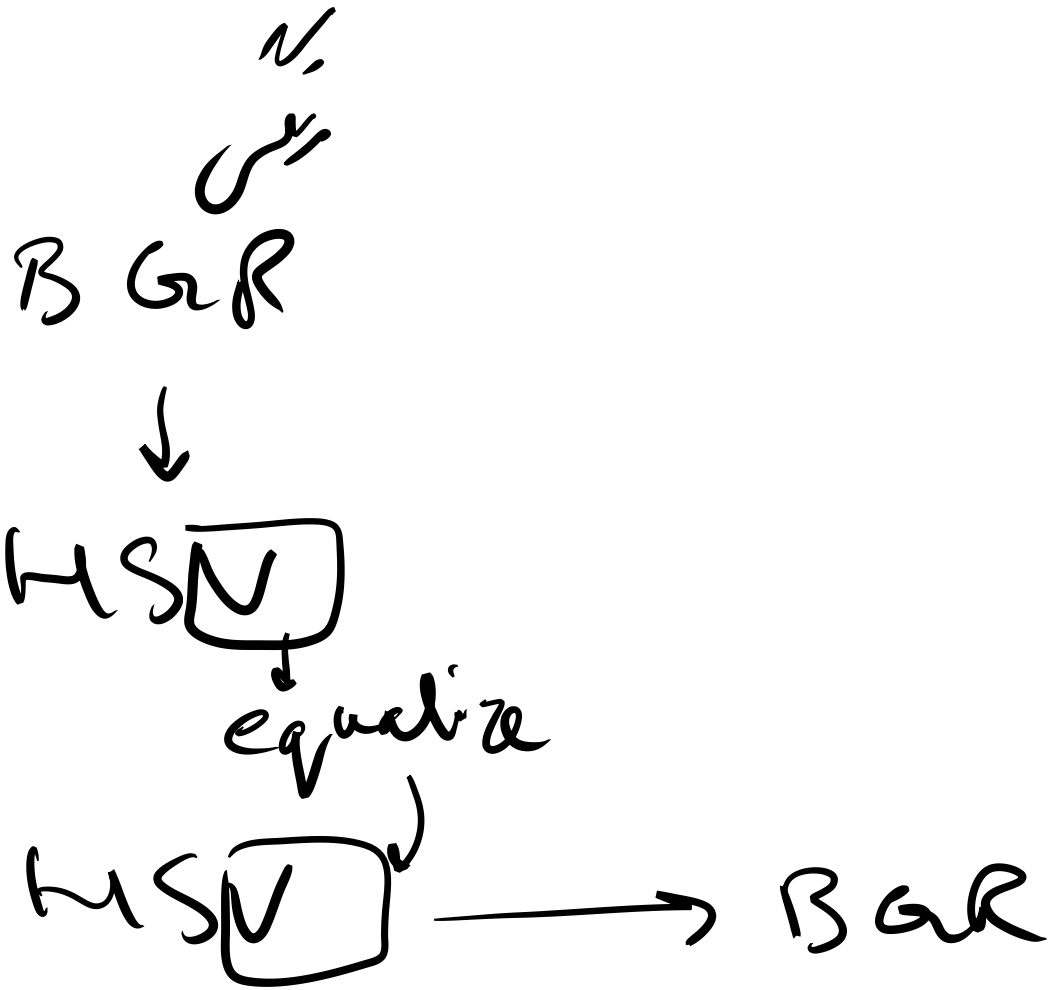




histogram equalization

CLAHE



HOG