Bilateral Filter

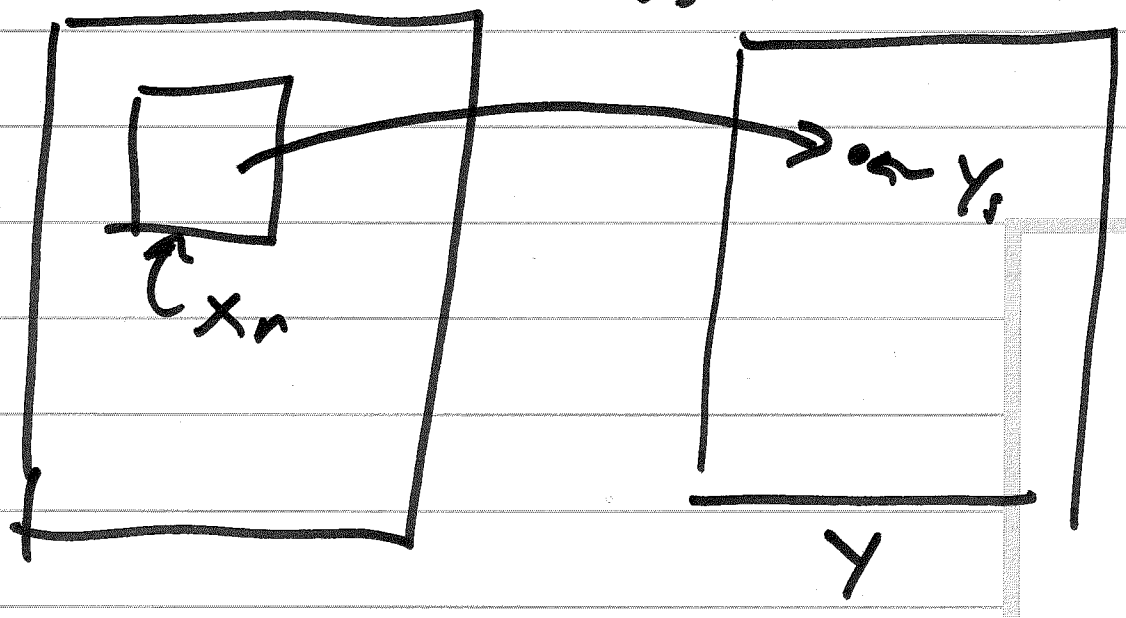
How to pick these

$$Y_s = \sum_n w_{s,n} x_n$$

$w_{s,n}$ = weight

$w_{s,n}$ should be large for pixels that are:

1) close in space
2) close in value



bilateral filter

$$\tilde{w}_{s,n} = \exp\left\{-\frac{1}{2}\frac{\|s-n\|^2}{\sigma_x^2}\right\} \exp\left\{-\frac{1}{2}\frac{|x_s - x_n|^2}{\sigma_v^2}\right\}$$

- $\tilde{w}_{s,n}$: Don't sum to 1.
- σ_x^2: blur in space
- σ_v^2: blur in value

$$w_{s,n} = \frac{\tilde{w}_{s,n}}{\sum_{n'} \tilde{w}_{s,n'}}$$

$$Y_s = \sum_n x_n w_{s,n}$$

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